

Section 2: ALTERNATIVES

This section presents the transportation improvement strategies and reasonable alternatives considered for the I-69 project. The reasonable alternatives considered and included the examination of five transportation alternatives: the No-Action Alternative, a Transportation Systems Management (TSM) Alternative, a Mass Transit Alternative, an Upgrade the Existing Facilities Alternative, and the Build Alternative. Alternatives determined not to meet the project purpose and need (as documented in Section 1) were eliminated from further consideration, while other reasonable alternatives were identified, evaluated, and refined.

2.1 THE STUDY PROCESS

The study process adopted for the completion of the location and environmental study for the I-69 project is shown in Exhibit 2-1. Four primary phases of work are involved and include:

- ❑ Scoping and Purpose and Need assessment which included the identification and evaluation of a broad range of transportation alternatives and led to consensus on important project and environmental issues
- ❑ Corridor Studies which developed several corridor alternatives, approximately 1 mile in width within the Study Area and identification of a Preferred Corridor

- ❑ Alignment Studies which developed, within the Preferred Corridor, specific highway alignment alternatives, approximately 300 feet in width and ultimately the identification of a Preferred Alignment
- ❑ Environmental Documentation, which consists of the preparation of the Draft and Final Environmental Impact Statements (EIS) and other supporting documents, and the selection of a single Selected Alignment identified in the Final EIS and Record of Decision.

Exhibit 2-2 illustrates this multi-step study process, which allows the examination of a full range of alternatives at both the corridor and alignment levels, with increasing detail as the study progressed. This enabled alternatives to be evaluated in several stages so that only the most practicable, those that meet the project purpose and need and that have the potential to minimize environmental impacts, are advanced to the next phase of study.

This study process satisfies various regulatory and coordination requirements for projects integrating the National Environmental Policy Act (NEPA) and the Section 404 Permit process. The multi-step project approach allowed a thorough consideration of all alternatives developed with respect to potential impacts to "waters of the United States",

including wetlands, as required under Section 404 of the Clean Water Act.

The required Section 404 b(1) alternatives analysis has been conducted during both the corridor and alignment studies phases as the project progressed. This approach first emphasized avoidance, and then minimization efforts to insure that the identified Preferred Corridor and ultimately the Selected Alignment, minimized wetland impacts to the greatest extent possible.

2.2 SCOPING

The objective of the scoping process was to identify environmental, socioeconomic, engineering, or other issues that should be considered during the study. The MPO, federal and state resource agencies, Native American Tribes, local officials and the public were invited to participate in a series of meetings in May and June 2001. These meetings provided an opportunity for participants to gain an understanding of the study process, discuss project benefits and concerns, and identify key issues to be considered during corridor and alignment development.

It was emphasized that early identification of environmental concerns maximized the ability to avoid and minimize impacts during alternatives development.

2.2.1 Metropolitan Planning Organization Involvement

A scoping meeting was held with the Northwest Louisiana Council of Governments and the

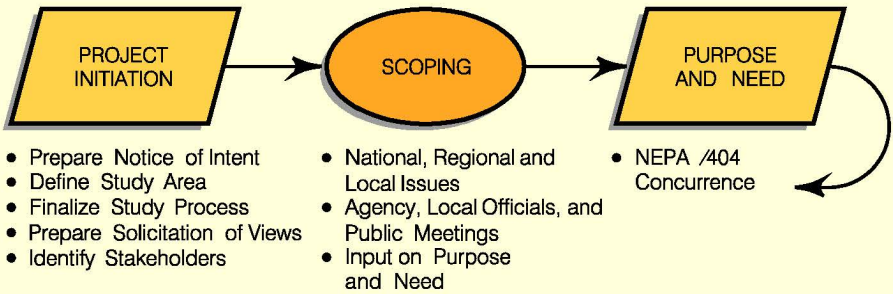
Transportation Planning Committee (Shreveport-Bossier City area Metropolitan Planning Organization (MPO)) on May 4, 2001 to initiate early agency involvement and cooperation in the study. The objective of this meeting was to present the I-69 study process and to discuss the transportation alternatives to be considered. The MPO indicated that only the Build Alternative satisfied, and was consistent with their regional transportation plan. An April 27, 2001 Resolution adopted by the MPO supports the Build Alternative as the best possible solution to meet the transportation need (see Appendix F, page F-1).

2.2.2 Agency Involvement

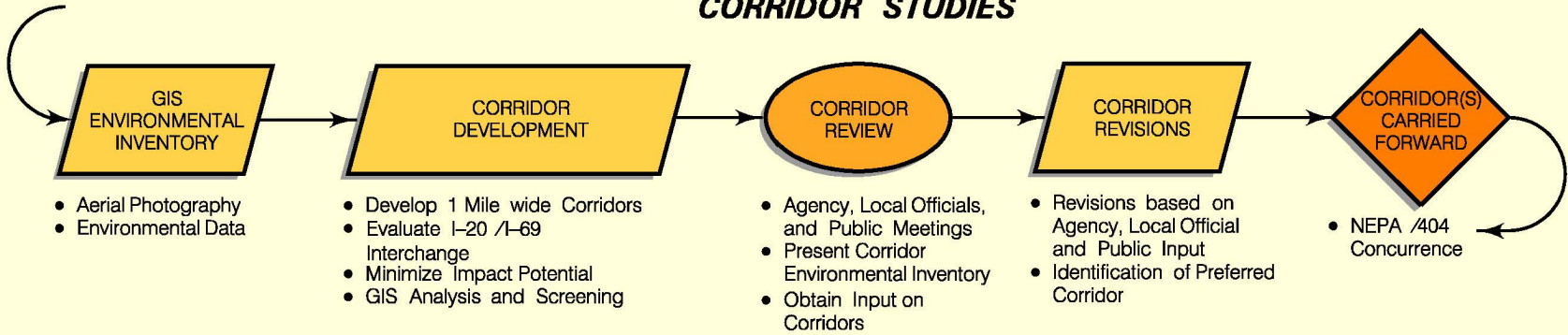
A scoping meeting was held with federal and state resource and regulatory agencies on June 6, 2001 to initiate early agency involvement and cooperation in the study. The objective of this meeting was to discuss the I-69 project study process and to identify key environmental issues to be considered during both the corridor and alignment phases of study.

Issues identified and discussed included Federally listed threatened and endangered species, specifically the Interior least tern, Wetland Reserve Program and Conservation Reserve Program areas, and wetland resources.

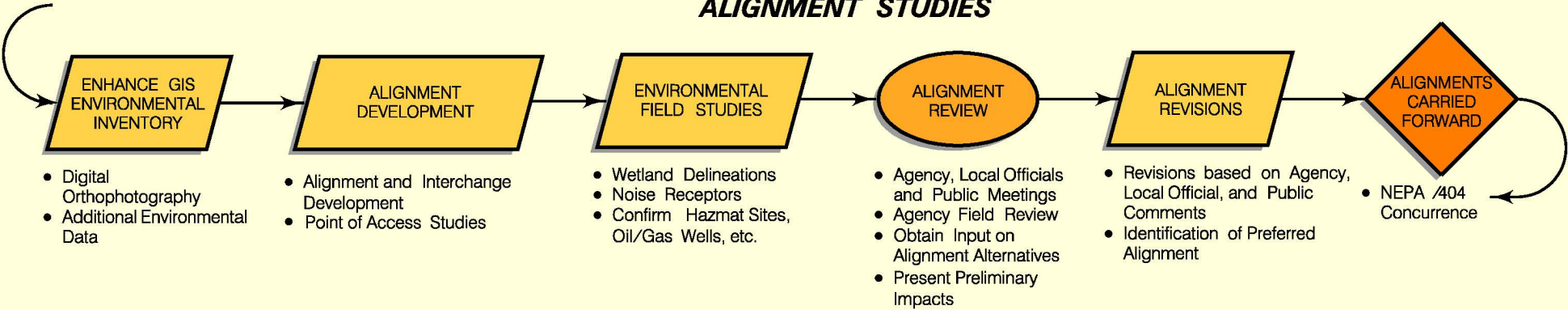
SCOPING and PURPOSE and NEED



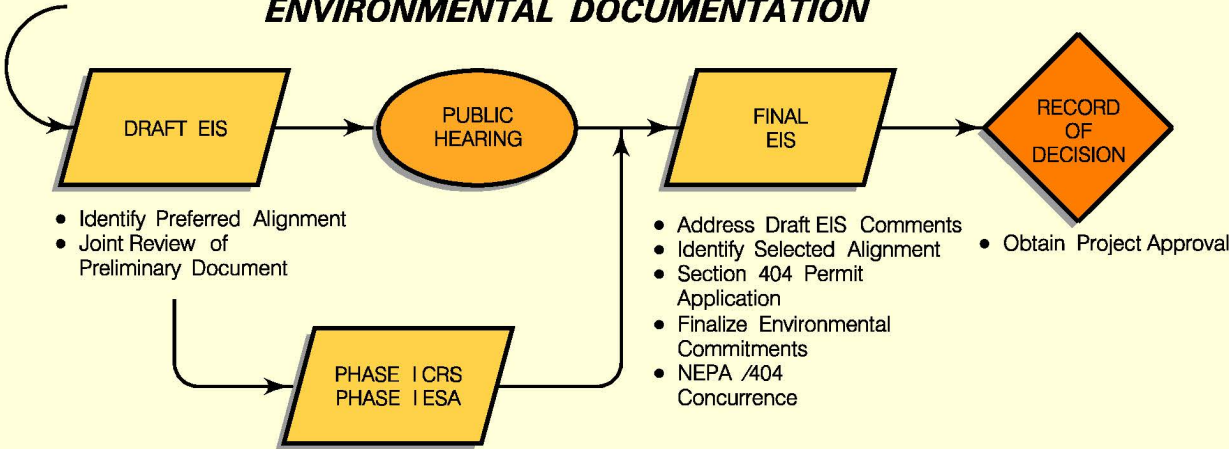
CORRIDOR STUDIES



ALIGNMENT STUDIES



ENVIRONMENTAL DOCUMENTATION



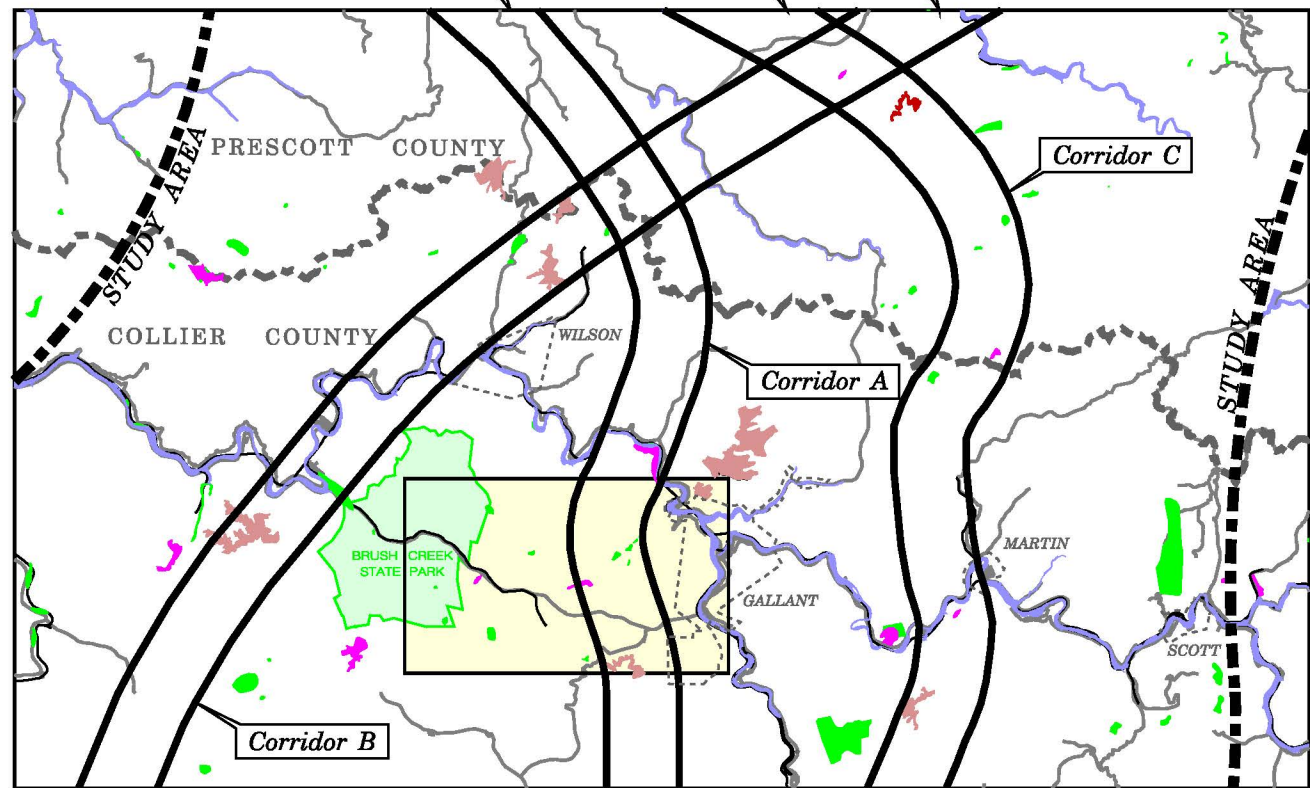
SYMBOLGY:

- Outreach Period
- Work in Progress
- Decision and /or Concurrence Point

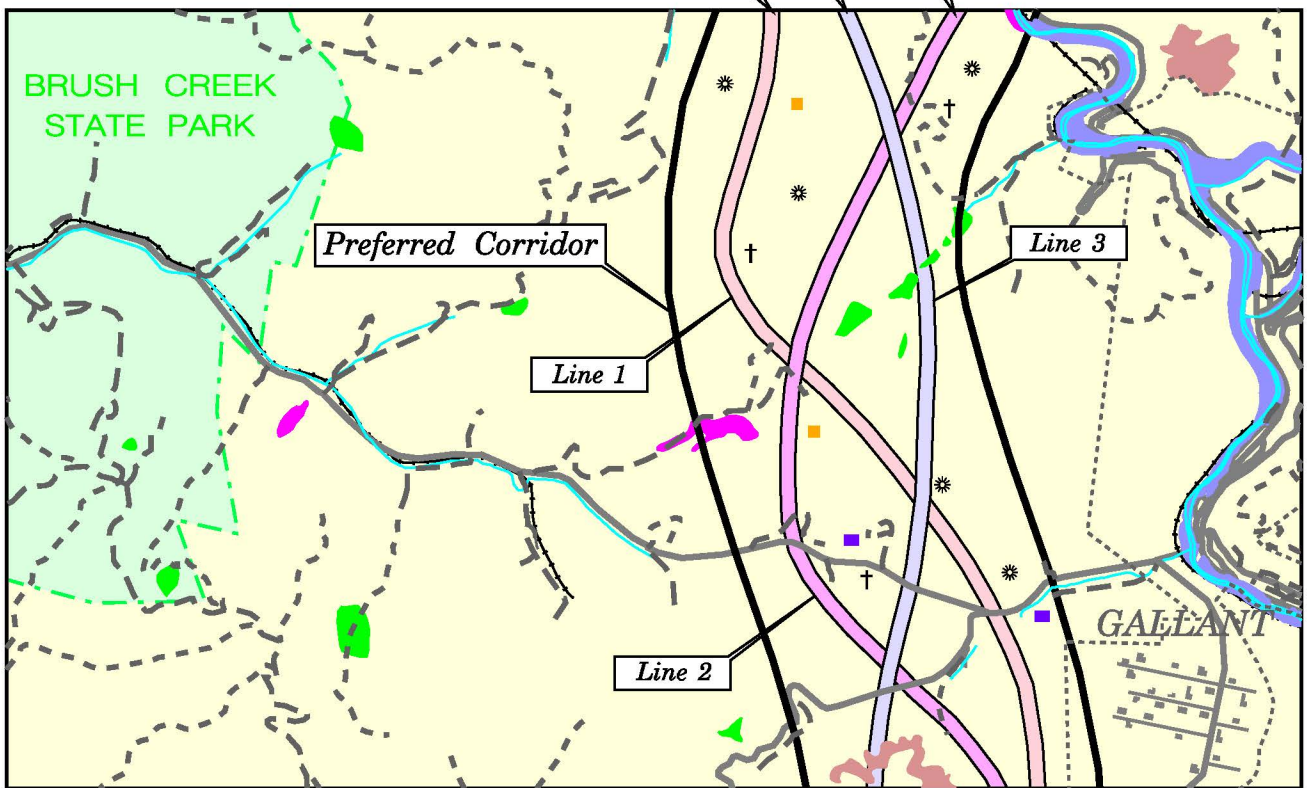
EXAMPLE OF STUDY METHODOLOGY

CORRIDORS
1 mile wide

ALIGNMENTS
Average Width = 300 feet



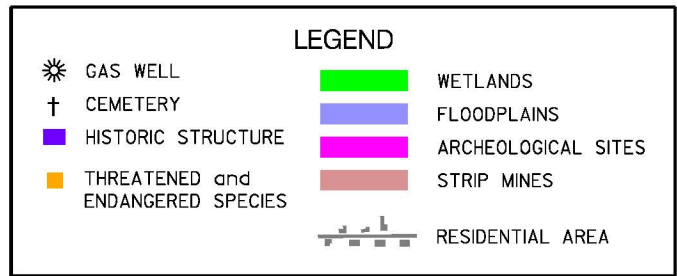
CORRIDOR STUDIES



ALIGNMENT STUDIES

NOTE:

The corridor and alignment locations and constraints shown are for illustrative purposes only and do not relate to the I-69 project Study Area.



I-69, SIU 15
US 171 to I-20

Exhibit 2-2
**CORRIDOR AND ALIGNMENT
STUDY METHODOLOGY**

Baker

NOT TO SCALE



2.2.3 Native American Tribe Involvement

Representatives from the Caddo Nation of Oklahoma, the Mississippi Band of Choctaw Indians, and the Quapaw Tribe of Oklahoma were invited to participate in the June 6, 2001 agency scoping meeting to discuss the I-69 project study process and to identify any issues or areas of traditional religious and cultural importance that should be considered during both the corridor and alignment phases of study. No correspondence was received from any tribe identifying specific concerns, but the Caddo Nation of Oklahoma did request government-to-government coordination because of their prior predominant occupation of the Study Area.

A separate meeting was held with the Caddo Nation of Oklahoma on November 2, 2001 in Binger, Oklahoma to discuss the I-69 project study process and any issues or areas of traditional religious and cultural importance that should be considered during both the corridor and subsequent alignment development. The Caddo Nation indicated that the archaeological sites on record at the Louisiana Department of Culture, Recreation and Tourism, Division of Archaeology were a good source of known Caddoan sites in the Study Area. The Tribe also indicated their desire to be consulted on Caddo Indian matters throughout the study process, especially during the Phase I Cultural Resources Survey of the Preferred Alignment.

2.2.4 Local Officials Involvement

A scoping meeting was held with local officials on June 7, 2001 to present an overview of the project study process and the proposed Study Area. Issues raised during the meeting included the desire for intermodal connectivity with the proposed highway, rail and the Port of Shreveport-Bossier, and the consideration of a future heavy rail line within the same transportation corridor. The Mayors of Stonewall and Haughton both indicated that their communities would benefit from the proposed highway but noted that residential and business impacts should be minimized to the extent possible.

2.2.5 Public Involvement

Public scoping meetings were held in Haughton, Louisiana on June 6, 2001 and in Stonewall, Louisiana on June 7, 2001 to present an overview of the Study Process and the proposed Study Area and to receive comments on the project. Over 200 people attended the meetings and 35 written comments were received. Public concern was the highway's potential proximity to and potential loss of personal property.

2.2.6 Alternatives Considered But Eliminated

Three of the broad transportation alternatives considered were eliminated from further study because they did not meet the Purpose and Need for the project. Alternatives eliminated include the Transportation Systems Management Alternative,

the Mass Transit Alternative, and the Upgrade the Existing Facilities Alternative.

Transportation Systems Management

A TSM Alternative would include limited construction activities designed to maximize the efficiency of the existing highway system. The TSM approach typically includes low cost improvements such as optimizing traffic signal timing, installing traffic signals, adding high occupancy vehicle lanes, minor realignments of horizontal curves, and widening shoulders. TSM measures are generally considered appropriate in urban areas with a population of over 200,000 persons (USDOT 1987).

While these measures would likely result in localized traffic safety and level of service improvements, the TSM Alternative would not provide the Interstate linkage for the proposed I-69 corridor (Corridor 18) consistent with the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21) legislation. The Northwest Louisiana Council of Governments and the Transportation Policy Committee (Shreveport-Bossier City area Metropolitan Planning Organization (MPO)) had also indicated that only the Build Alternative satisfies the regional transportation need (NLCOG 2001). The TSM Alternative was eliminated from further consideration.

Mass Transit Alternative

A Mass Transit Alternative, such as bus or rail service, is generally only relevant in urban areas with a population of over 200,000 (USDOT 1987), and where concentrated trip origins and/or destinations make mass transit a viable transportation alternative. Mass transit would not be a reasonable transportation alternative to satisfy the project's National purpose and need to improve international and interstate movement of freight and people, or facilitate connections to intermodal facilities and major ports. The MPO had also indicated that only the Build Alternative satisfies the regional transportation need (NLCOG 2001). The Mass Transit Alternative was eliminated from further consideration.

Upgrading the Existing Road Network

Existing primary highways in the Study Area, LA 3276, LA 175, LA 527, and LA 157 were evaluated to determine if they would function as feasible alternatives for this study. Many residences and businesses are located along these area highways. Reconstruction to a divided, four-lane, fully controlled access facility would require that all driveways and secondary road connections be severed. To maintain local access, frontage roads would need to be constructed. Reconstruction of these facilities on their existing locations would also reduce the opportunity to avoid and minimize potential environmental impacts to resources such as wetlands, floodplains,

churches and cemeteries adjacent to the existing highways. Furthermore, reconstruction of LA 3276 and LA 157 for the proposed highway would require bypassing Stonewall and Haughton, respectively, to avoid substantial community impacts and would involve developing new location alternatives in these areas.

Existing Red River crossing locations are limited to LA 511 at Bossier City, Louisiana and US 84 at Coushatta, Louisiana, which are both beyond the Study Area. LA 527 and LA 175 are located on opposite sides of the Red River. The portion of the proposed highway between these state routes would be on new location with a new bridge crossing the Red River near Watson Lake and Old River Lake, affecting the wetlands and the vast floodplain at that location.

Similarly, a portion of the proposed highway would require construction on new location to connect LA 175 with Parish Road 16 and LA 3276. Reconstruction of Parish Road 16 to a divided, four-lane, fully controlled access facility would require that all driveways and secondary road connections be severed and frontage roads constructed to maintain local access for the area residences and businesses.

The MPO had also indicated that only the Build Alternative satisfies the regional transportation need (NLCOG 2001).

Based on the potential community, residential and business impacts; the inability to avoid and minimize adjacent environmental resources; and maintaining consistency with the regional transportation plan, reconstruction of LA 3276, LA 175, LA 527, and LA 157 was not considered a feasible alternative and was eliminated from further consideration.

2.2.7 Alternatives Considered For Further Study

Of the five transportation alternatives considered for this project, the No-Action and Build Alternatives were retained for further study.

The No-Action Alternative

The alternatives developed were compared to the decision to take no action. The No-Action alternative would not involve the construction of the I-69 project, but would involve normal maintenance activities and planned safety improvements to area roadways.

Selection of the No-Action alternative would avoid a major state and federal expenditure and would avoid major impacts to the social, economic, natural and cultural environments. The No-Action alternative will be maintained as an alternative to new highway construction until a final decision has been determined and documented through the completion of the EIS process.

Build Alternatives

Development of the Build Alternatives involved the evaluation of a full range of alternatives. Section 2.3 documents the corridor development and evaluation processes, and describes and discusses the reasonable alternatives developed.

2.3 CORRIDOR STUDIES

The Corridor Studies considered the feasibility of several corridor alternatives 1 mile in width that were evaluated with respect to affected social, natural, and cultural environmental features. The Corridor Studies consisted of the following work efforts:

- ❑ Collection of environmental information from agency sources and fieldwork to create an Environmental Inventory for the Study Area
- ❑ Creation of a project Geographic Information System (GIS) using existing environmental data
- ❑ Development of corridors and GIS environmental analysis
- ❑ Presentation of corridors and Environmental Inventory to local officials and the public for review and comment
- ❑ Agency and Native American tribe review
- ❑ Modification of corridors, as necessary, based on public and agency involvement
- ❑ Identification of a Preferred Corridor in which to develop specific, more detailed highway alignments.

2.3.1 Environmental Inventory

Environmental data within the Study Area were collected from a variety of federal and state sources and entered into the project GIS for subsequent analysis. The Study Area extends approximately 2 miles west of the proposed US 171 southern terminus and approximately 2 miles north of the proposed Interstate 20 northern terminus for the I-69 project in order to identify potential areas of concern that could preclude or hinder development of adjacent I-69 Sections of Independent Utility (SIU). Data obtained from various agencies or field collected included:

- ❑ Project Mapping – Obtained 1998 and 1999 National Aerial Photography Program (NAPP) color infrared (CIR) aerial photography
- ❑ Floodplains - Federal Emergency Management Agency (FEMA) floodplain maps were used to determine the extent of the 100-year floodplain and floodway
- ❑ Wetlands – Determined wetland areas based on photointerpretation of NAPP CIR aerial photography with limited ground-truthing
- ❑ Protected Species - Obtained digital information from the Louisiana Department of Wildlife and Fisheries, Natural Heritage Program to determine the location of any federal and state listed species
- ❑ Hazardous Materials - Obtained information on landfills, open dumps, Resource Conservation and Recovery Act (RCRA), Comprehensive

Environmental Response and Compensation Liability Act (CERCLA), Underground Storage Tank (UST), and Leaking Underground Storage Tank (LUST) sites from the Louisiana Department of Environmental Quality

- ❑ Groundwater Resources – Obtained wellhead protection areas from the Louisiana Department of Environmental Quality Aquifer Evaluation and Protection Section. The Environmental Protection Agency was contacted to identify the location of principle or sole source aquifers (SSA) within the Study Area. No sole source aquifers are located within the Study Area
- ❑ Cultural Resources - Obtained information on known archaeological sites and historic structures from the Louisiana Division of Archaeology and Division of Historic Preservation. Area cemeteries were identified from USGS maps. Prehistoric probability Areas were determined for areas that may contain archaeological resources
- ❑ Oil & Gas Wells – Obtained digital oil and gas well information from the Louisiana Geographic Information Center
- ❑ Interior Least Tern Nesting Sites – Obtained Interior least tern nesting site locations through consultation with the Louisiana Department of Wildlife and Fisheries, Natural Heritage Program and local experts

- ❑ Reserve Program Areas – Obtained information on Wetland Reserve Program and Conservation Reserve Program areas from the Natural Resources Conservation Service
- ❑ Community Facilities – Obtained schools, churches, hospitals, parks, and public facilities from USGS topographic maps
- ❑ Standing Structures – Conducted a field inventory within the corridors developed to obtain primary standing structures including residences, businesses, churches, schools, and other public facilities.

2.3.2 Project Geographic Information System

A key component of the project study process was the use of Geographic Information System (GIS) technology and the development of a project specific GIS. The GIS is an effective tool for managing environmental data for extensive geographic areas, in this case a Study Area of approximately 300 square miles, in a cost and time efficient manner. The benefits of the GIS approach include:

- ❑ Consolidation of all environmental and engineering data, regardless of source or scale, onto one common map base
- ❑ Consideration of key environmental issues before alternatives are developed
- ❑ Instills confidence in the public and the resource agencies through a “seeing is believing” approach that allows visual confirmation of particular issues of concern

(location of endangered species habitat, sensitive wetland areas, etc.)

- ❑ Efficiently analyzes information when changes in alternatives occur. “What if” scenarios can be examined quickly and accurately to evaluate possible alternative revisions with a minimum amount of time and effort.

2.3.3 Identification of Key Study Area Issues/Constraints

Prior to initial corridor development, key environmental, engineering, and social issues were identified within the Study Area based on the information gathered during the Scoping Process from the public, local officials, and federal and state resource agencies. In the southern portion of the Study Area, a number of issues or constraints provided the basis for screening the various corridors and included:

- ❑ Wallace Lake and the floodplains/wetlands associated with Wallace Bayou
- ❑ Floodplains associated with Brushy Bayou
- ❑ Existing residential and business development along US 171
- ❑ Caspiana Oil & Gas Fields
- ❑ The location of the existing LA 3276 and planned Pines Road interchanges with I-49.

In the middle portion of the Study Area, a number of issues or constraints provided the basis for screening the various corridors and included:

- ❑ Floodplains/wetlands associated with the Red River, Flat River and Red Chute Bayou systems
- ❑ Wetland Reserve Program conservation areas
- ❑ Lucas Sludge Disposal Site
- ❑ Elm Grove Oil & Gas Fields
- ❑ Navigation issues and maritime safety along the Red River
- ❑ The location of interchanges with LA 1 and US 71
- ❑ Multi-modal access to rail facilities and the Port of Shreveport–Bossier, and the opportunity to incorporate rail into the transportation corridor in the future.

Numerous issues and constraints provided the basis for screening the various corridors in the northern portion of the Study Area, including:

- ❑ Barksdale Air Force Base and the Louisiana Army Ammunition Plant
- ❑ Sligo Oil & Gas Fields
- ❑ Extensive residential and commercial development in Haughton
- ❑ Floodplains/wetlands associated with the Foxskin and Clark Bayous
- ❑ The ability to minimize longitudinal and maximize perpendicular stream crossings
- ❑ The location of the existing LA 157 interchange with I-20.

2.3.4 Initial Corridor Development and Screening

Corridor Screening Process

The issues identified in Section 2.3.3 were used to develop and refine the screening criteria for the corridors. In addition, corridor development fully considered the project's National Purpose and Need and established logical termini.

The corridor-screening criteria identified as most important by the public and local officials was the ability to reduce and avoid residential and business displacements.

State and federal resource agency concerns as well as the ability to comply with appropriate state and federal regulations were also used to identify important screening criteria and included:

- ☐ Potential impacts to wetlands and floodplains. Identification of these resources is important to conducting the required Section 404 b(1) alternatives analysis
- ☐ Potential impacts to cemeteries, parks, and recreation areas. Identification of these resources is important to minimizing potential Section 4(f) and National Historic Preservation Act, Section 106 issues
- ☐ Protected Species Locations. The U.S. Fish & Wildlife Service (FWS) expressed concern with the early identification and avoidance of these areas, particularly the Interior least tern nesting areas

- ☐ Wetland Reserve Program Areas. These areas are permanently deeded as conservation areas and should be avoided
- ☐ Cultural Resources. Known archaeological sites and historic structure locations were obtained for the Study Area so that these resources could be fully considered during corridor development. In addition, prehistoric archaeological probability areas were developed to determine, in the broad sense, the likelihood of encountering buried cultural materials. Correspondence inviting tribal participation in the study process and the Corridor Study was sent to the Caddo Nation of Oklahoma, the Mississippi Band of Choctaw Indians, and the Quapaw Tribe of Oklahoma requesting the identification of any issues or areas of traditional religious and cultural importance that should be considered during the development of project alternatives.

Engineering issues focused on the Red River bridge crossing and the proposed interchanges at LA 1 and US 71 as well as the proposed interchanges at US 171, I-49 and I-20. The engineering issues used as screening criteria included the ability to satisfy:

- ☐ Navigation concerns and bridge span/pier location requirements for the Red River bridge crossing
- ☐ Highway design criteria between the LA 1 and US 71 interchanges

- ❑ Interchange Point of Access and design criteria, particularly at the northern terminus of the project.

Failure to address and evaluate these concerns could limit the constructability of the proposed highway facility in the future.

Initial Corridor Development

Using the key project issues/constraints as a screening guide, four distinct corridors (A, B, C, and D) were developed within the Study Area (see Exhibit 2-3). Within some reaches of the project, two or more corridors may be in the same location due to environmental or engineering constraints. The GIS-based Environmental Inventory mapping was used to avoid and minimize impacts to sensitive environmental resources, while considering engineering design criteria. In addition, initial corridor development responded to public and local officials concerns regarding potential residential and business displacements. Each corridor is 1 mile wide and extends from US 171 near Stonewall northward to I-20 near Haughton.

Table 2-1 presents a Preliminary Corridor Inventory Comparison of the four corridors developed and the resources identified within each.

It is important to recognize that the values shown for each corridor are the resources within the entire 1-mile width. Actual highway impacts for a roadway of approximately 300 feet in width would be substantially less.

The information presented in Table 2-1 is a comparative tool to assess the potential involvement with various resources and the ability to address specific public/community issues across all corridors. It is also important to note that the presence of a resource within a corridor is not an indication that the resource would be affected. Through more detailed assessment during the Alignment Studies, many resources, such as recorded historic structures or underground storage tanks, can be avoided entirely.

Corridor A

Corridor A begins at US 171 near the north corporate limits of Stonewall and proceeds easterly crossing I-49, passing along the southern portion of Wallace Lake and crossing Wallace Bayou. Near the DeSoto/Caddo Parish line, the corridor turns to the northeast and crosses LA 1 and the Red River into Caddo Parish. The corridor turns more northerly passing north of Stumpy Lake and crosses Red Chute Bayou then LA 527 approximately 2 miles west of the LA 157/LA 527 intersection. The corridor then turns north, stays west of and parallels LA 157, passing between the Barksdale Air Force Base and the west corporate limits of Haughton. The corridor ends at I-20 just east of the LA 614 bridge passing over I-20.

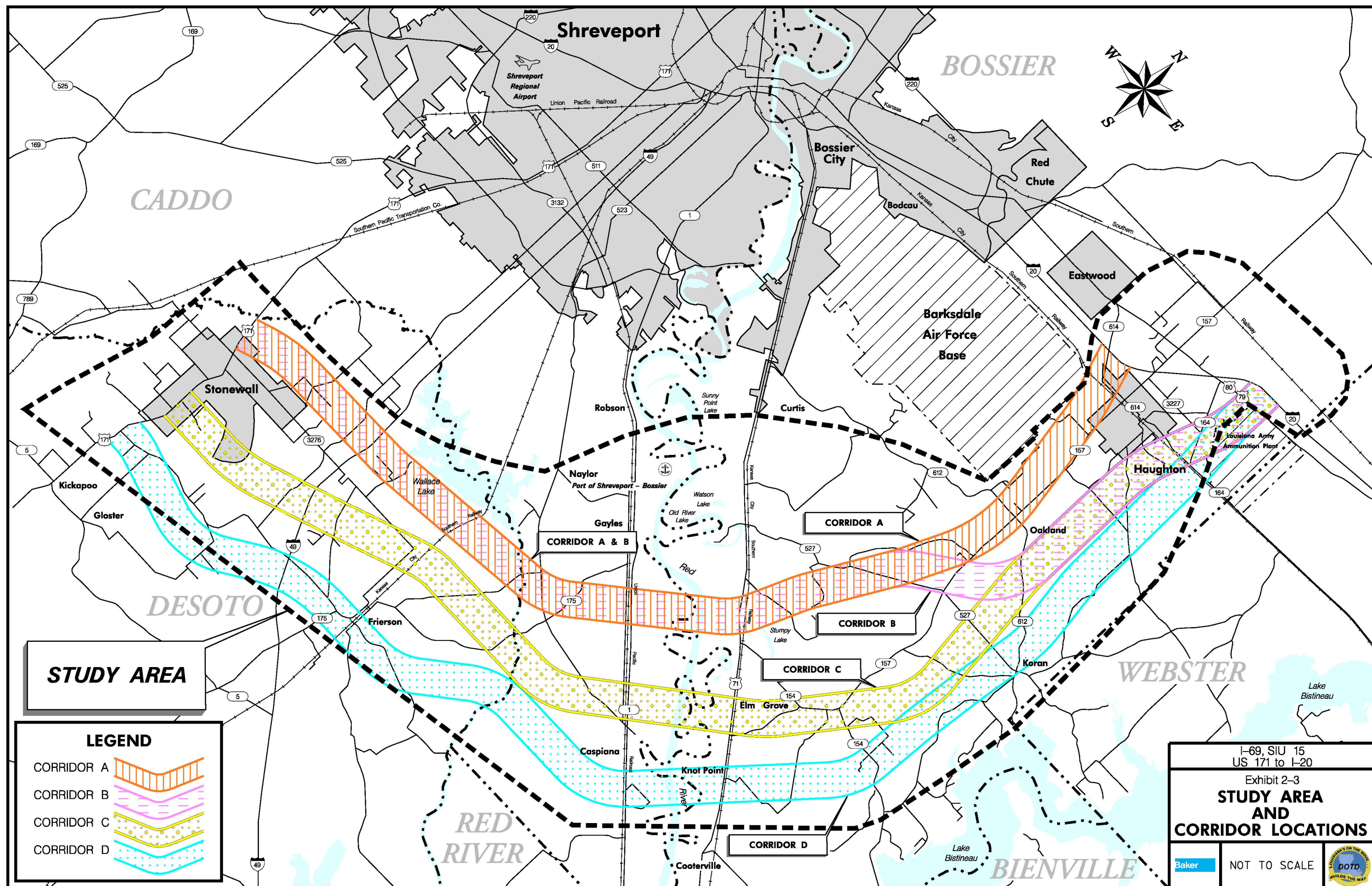


Table 2-1
PRELIMINARY CORRIDOR INVENTORY COMPARISON
(Values Shown Are An Inventory of Resources Within The Entire 1-Mile Wide Corridor
Actual Highway Impacts Would Be Substantially Less)

Category	Corridor			
	A	B	C	D
Corridor Length (miles)	30.2	33.4	37.0	40.3
Structures				
<i>Residences</i>	254	182	147	127
<i>Mobile Homes</i>	245	194	196	136
<i>Apartment Buildings</i>	-	-	1	-
<i>Businesses</i>	17	13	9	14
<i>Churches</i>	6	5	2	6
<i>Public Facilities</i>	-	1	-	3
Total Structures	522	395	355	286
Cemeteries	2	1	3	3
Parks	-	-	-	-
Natural Resources				
<i>Wetlands (acres)</i>	916	962	1,124	2,019
<i>Known Threatened or Endangered Species Locations</i>	-	-	1	1
<i>100-Year Floodplain (acres)</i>	6,300	6,176	6,306	7,779
<i>Wetland Reserve Program Areas (acres)</i>	-	-	-	666
Cultural Resources (Sites with Caddoan components shown in parentheses)				
<i>NRHP Listed Sites</i>	- (-)	- (-)	- (-)	- (-)
<i>Recorded Potentially Eligible Sites</i>	5 (4)	6 (4)	8 (2)	4 (2)
<i>Recorded Ineligible Sites</i>	3 (2)	2 (-)	6 (-)	8 (-)
Prehistoric Archaeology Probability Areas				
<i>Red River Alluvial Valley</i>				
<i>High (acres)</i>	516	516	540	439
<i>Medium (acres)</i>	3,240	3,240	2,758	2,496
<i>Low (acres)</i>	2,147	2,147	3,038	4,106
<i>Upland Areas</i>				
<i>High (acres)</i>	606	816	422	1,332
<i>Medium (acres)</i>	951	1,063	707	1,137
<i>Low (acres)</i>	9,270	10,531	12,976	11,854
Engineering Issues (Ranked 1 through 4 with 1 being the best satisfied)				
<i>Red River Bridge Crossing / LA 1 & US 71 Interchanges</i>	3	3	1	2
<i>US 171 Interchange</i>	3	3	1	2
<i>I-49 Interchange</i>	2	2	1	4
<i>I-20 Interchange</i>	4	1	1	1
Wellhead Protection Areas	4	5	5	2
Known Hazardous Materials Sites	2	3	1	3
Oil and (Gas) Wells				
<i>Producing</i>	1 (39)	- (26)	- (29)	- (10)
<i>Shut In</i>	1 (9)	- (1)	- (5)	- (1)
<i>Active Injection</i>	- (-)	- (-)	- (-)	- (-)

Source: Michael Baker Jr., Inc., 2001

Concerns with respect to Corridor A include the close proximity of floodplain/wetlands associated with Wallace Lake, potential gas well impacts and potential involvement with the Lucas Sludge Disposal Site located between LA 1 and Bayou Pierre. Additional concerns include navigation issues associated with the bend in the Red River near the corridor crossing and potential residential and business displacements. The Mayors of Stonewall and Haughton identified displacements as their primary concern. The northern terminus location at I-20 could result in potentially unavoidable residential and business displacements in adjacent SIU 14.

Corridor B

Corridor B begins at US 171 near the north corporate limits of Stonewall, and coincides with Corridor A until crossing LA 527. After crossing LA 527, the corridor turns more easterly crossing LA 157 approximately 0.5 miles north of the LA 157/LA 527 intersection and turns north, crosses Johnson – Koran Road, and stays east of and parallel to LA 157 for about three miles. Corridor B then turns eastward passing along the eastern corporate limits of Haughton and the western boundary of the Louisiana Army Ammunition Plant. The corridor ends at I-20 near an abandoned rest area on I-20.

Concerns with respect to Corridor B include the close proximity of floodplain/wetlands associated with Wallace Lake, potential gas well impacts and

potential involvement with the Lucas Sludge Disposal Site. Additional concerns include navigation issues associated with the bend in the Red River near the corridor crossing, potential residential and business displacements, and potential involvement with the Louisiana Army Ammunition Plant.

Corridor C

Corridor C begins at US 171 approximately one mile north of the south corporate limits of Stonewall, proceeds northeasterly crossing I-49 approximately 1.25 miles south of the I-49/LA 3276 interchange and crosses Flagship Road. The corridor turns due east crossing Wallace Bayou. The corridor then turns northeast, crossing LA 1, the Red River, US 71 and the Flat River. Corridor C continues turning to the north, crossing LA 157, LA 527, and Johnson – Koran Road. Corridor C then joins and coincides with Corridor B, proceeding northward and ending at I-20 near an abandoned rest area.

Concerns with respect to Corridor C include the large floodplain crossing and potential wetlands impacts in the Red River Alluvial Valley. Additional concerns include potential residential, Frierson Plaza Apartment and business displacements, potential gas well impacts and potential involvement with an identified Interior least tern nesting site and the Louisiana Army Ammunition Plant.

Corridor D

Corridor D begins at US 171 approximately 0.75 miles south of the southern corporate limits of Stonewall and proceeds generally easterly, crossing I-49 approximately 2 miles north of its interchange with LA 175. The corridor continues along the Study Area southern limit to Case Road and then proceeds to the northeast crossing LA 1 near Caspiana, the Red River, US 71, and LA 157. Near LA 154, the corridor turns almost due north following Clark Bayou and then joins and coincides with Corridor B and Corridor C along the western boundary of the Louisiana Army Ammunition Plant. Corridor D ends at I-20 near the abandoned rest area.

Concerns with respect to Corridor D include the large floodplain crossing and potential wetlands impacts in the Red River Alluvial Valley and involvement with a Wetland Reserve Program conservation area. Additional concerns include potential residential and business displacements, and potential involvement with the North DeSoto Parish Middle and High schools located on US 171, an identified Interior least tern nesting site and the Louisiana Army Ammunition Plant. Of additional concern is the potential for multiple crossings of, and longitudinal floodplain impacts to Clark Bayou, and the high probability of involvement with previously unrecorded archaeological sites associated with Clark Bayou.

2.3.5 Corridor Studies Outreach

After development of the environmental inventory, corridors, and subsequent corridor comparison analyses, meetings were held with the resource agencies, local officials, and the public to present the results of the Corridor Studies and to obtain input on the corridors developed.

Agency Involvement

Federal and state agencies were invited to participate in a December 11, 2001 agency coordination meeting to review the environmental inventory and the corridors developed. The U.S. Environmental Protection Agency (EPA) indicated that Corridor C appeared the most favorable, while Corridor D the least.

Native American Tribe Involvement

Representatives from the Caddo Nation of Oklahoma, the Mississippi Band of Choctaw Indians, and the Quapaw Tribe of Oklahoma were invited to participate in the December 11, 2001 agency coordination meeting to discuss the corridors developed and to identify any issues or areas of traditional religious and cultural importance that should be considered during the alignment phase of study. No correspondence was received from any tribe identifying specific concerns.

Local Officials Involvement

Local officials were invited to participate in a December 12, 2001 local officials meeting to review

the environmental inventory and engineering issues and the corridors developed. Concerns included proximity to metropolitan areas and the Port of Shreveport-Bossier, compatibility with existing rail lines, corridor preservation and project cost.

A January 30, 2002 meeting was held with the MPO, the Mayor of Shreveport, the Mayor of Bossier City, the Port of Shreveport-Bossier, and the Shreveport Chamber of Commerce (Chamber) to discuss the corridors developed. The Mayors, the Port, and the Chamber requested that Corridor A be revised or a new corridor developed locating the project closer to Shreveport, Bossier City and the Port. The Mayor of Shreveport and the Chamber expressed concern about economic development and the loss of economic opportunities if the highway was located too far from the metropolitan area. The Mayor also indicated that the Lucas Sludge Disposal Site could be relocated, if necessary, to accommodate a highway corridor.

The Port expressed concern about intermodal connectivity and indicated that the corridor could pass through their property in order to locate the highway closer to the City of Shreveport. The Port's stated position on utilizing their property differed from previous Port correspondence.

Public Involvement

Approximately 200 people attended the public meetings held December 11 and December 12, 2001 and over 80 comment forms

were received. Most comment forms favored either Corridor A or a combination of Corridors A, B or C. Public concern with all corridors was the proximity to and potential loss of personal property. Residents of Williamson Road and Stacey Lane near Stonewall expressed concern with the proximity of Corridor C and potential loss of personal property. In addition, the public favored a location closer to Shreveport and the Port of Shreveport-Bossier and expressed concern regarding the Old Port Petroleum solid waste site west of US 171 at Corridor C.

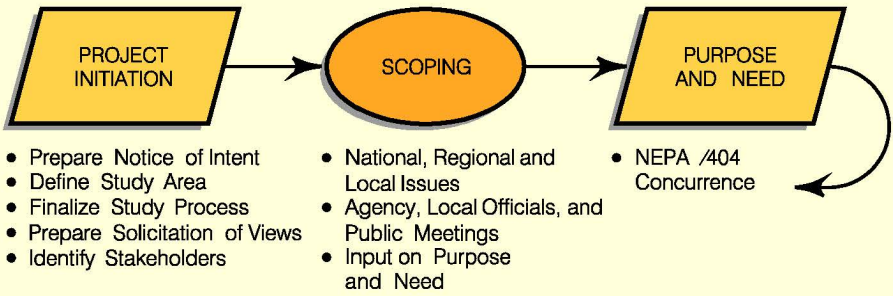
2.3.6 Additional Corridor Studies

Additional corridors were studied in response to issues raised by local officials and the public following the December 2001 and January 2002 outreach meetings. The revised study process is shown in Exhibit 2-4. The issues raised included:

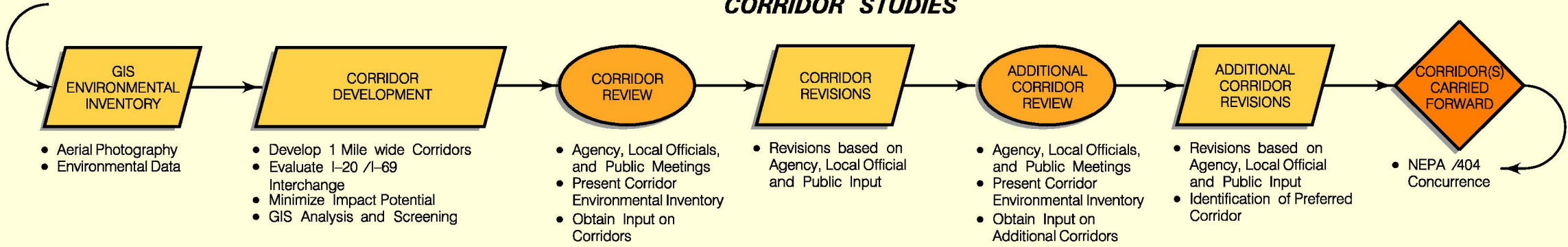
- ❑ Locating a corridor closer to Shreveport, Bossier City and the Port of Shreveport-Bossier for economic development and intermodal connectivity
- ❑ Avoiding the Williamson Road/Stacey Lane residential area and the Old Port Petroleum facility while maintaining a southern route around Stonewall.

These and the issues identified in Section 2.3.3 were used to develop and refine the screening criteria (see Section 2.3.4) for the additional corridors.

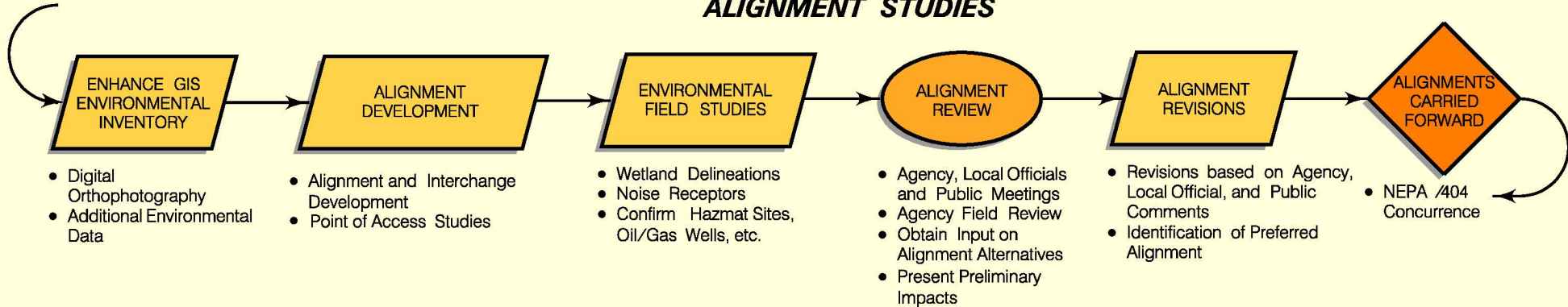
SCOPING and PURPOSE and NEED



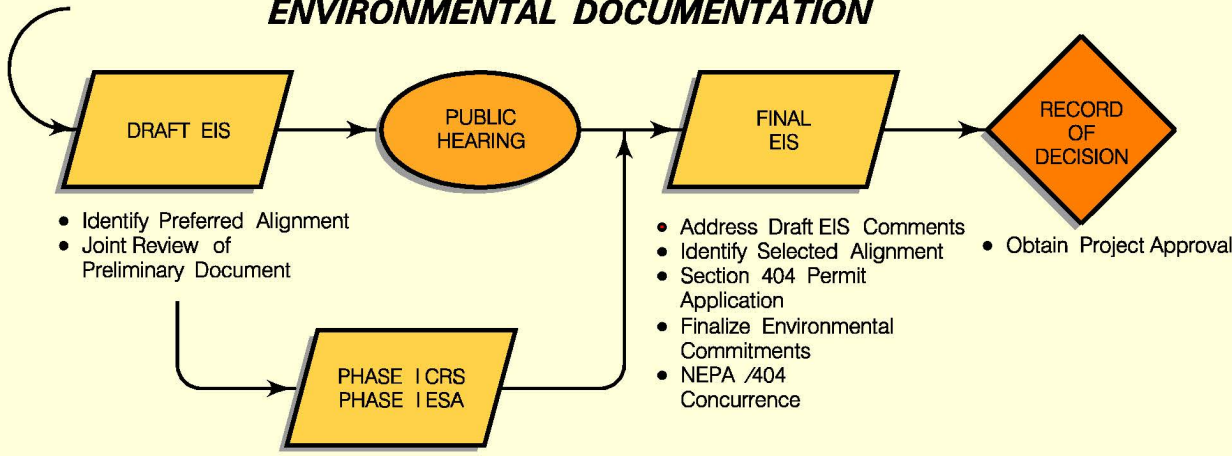
CORRIDOR STUDIES



ALIGNMENT STUDIES



ENVIRONMENTAL DOCUMENTATION



SYMBOLOLOGY:

- Outreach Period
- Work in Progress
- Decision and /or Concurrence Point

The additional corridor development also fully considered the project's National Purpose and Need and established logical termini.

Additional Corridor Development

The Study Area was expanded near Sunny Point Lake in order to evaluate additional corridors closer to Shreveport and Bossier City. Consistent with the original corridor development, environmental data within this Expanded Study Area was collected from a variety of federal and state sources and entered into the project GIS for subsequent analysis (see Section 2.3.1).

Three additional corridors (Corridors E, F, and G) were developed using the project issues/constraints as a screening guide. The four original and three additional corridors are presented in Exhibit 2-5. All additional corridors utilize a northern terminus location that coincides with original Corridors B, C, and D, near an abandoned rest area on I-20. The Corridor A northern terminus location at I-20 could result in potentially unavoidable residential and business displacements in adjacent SIU 14. The Mayors of Stonewall and Haughton had previously identified displacements as their primary concern.

Within some reaches of the project, two or more corridors may be in the same location due to environmental or engineering constraints. The GIS-based Environmental Inventory mapping was used to avoid and minimize impacts to sensitive

environmental resources, while considering engineering design criteria. As with the original corridors, the additional corridors are 1 mile wide and extend from US 171 near Stonewall northward to I-20 near Haughton.

Table 2-2 presents a Preliminary Corridor Inventory Comparison of the four original and three additional corridors developed. The values shown for each corridor are the resources within the entire 1-mile width. Actual highway impacts for a roadway of approximately 300 feet in width would be substantially less.

Corridor E

Corridor E begins at US 171 near the north corporate limits of Stonewall, and coincides with Corridor A and Corridor B until crossing the Kansas City Southern (KCS) Railway east of I-49. After crossing the KCS Railway, the corridor turns north passing east of Naylor and Robson, then turns eastward passing south of Curtis and LA 612. After crossing LA 157, Corridor E joins and coincides with Corridor B, and passes along the eastern corporate limits of Haughton and the western boundary of the Louisiana Army Ammunition Plant and ends at I-20 near an abandoned rest area on I-20. Corridor E approximates the location of a combined I-69/Inner Loop (LA 3132) Extension Corridor (Shreveport 1991).

Concerns with respect to Corridor E include the close proximity of floodplain/wetlands associated

with Wallace Lake, potential gas well impacts, potential involvement with known archaeological sites and high and medium probability areas along the Red River. Additional concerns include navigation issues associated with the bend in the Red River near the corridor crossing, the width of the Red River and skew angle at the corridor crossing, potential residential and business displacements, and potential involvement with the Louisiana Army Ammunition Plant.

Corridor F

Corridor F begins at US 171 approximately one mile north of the south corporate limits of Stonewall, and coincides with Corridor C until crossing the KCS Railway east of I-49. After crossing the KCS Railway the corridor turns north, crosses Corridors A and B, then joins and coincides with Corridor E until reaching Naylor. Corridor F then turns northeasterly, crosses LA 1, and passes through the Port of Shreveport-Bossier property approximately 1 mile northwest of the existing Port infrastructure. The corridor crosses the Red River then turns more easterly crossing US 71.

Corridor F turns more northerly as it approached LA 157, then joins and coincides with Corridors B, C, and E north of Johnson – Koran Road, ending at I-20 near an abandoned rest area.

Concerns with respect to Corridor F include the floodplain crossing and potential wetlands impacts

in and potential involvement with known archaeological sites and high and medium probability areas along the Red River Alluvial Valley.

Additional concerns include potential residential (including the Williamson Road/Stacey Lane area), Frierson Plaza Apartment and business displacements, potential gas well impacts and potential involvement with the Louisiana Army Ammunition Plant. Potential involvement with the Old Port Petroleum solid waste site could also occur in SIU 16.

Corridor G

Corridor G begins at US 171, the same location as Corridor D, approximately 0.75 miles south of the southern corporate limits of Stonewall and proceeds generally northeasterly, joining and coinciding with Corridors C and F east of Williamson Road and Stacey Lane. From this location northward, Corridor G is identical to Corridor F, and ends at I-20 near an abandoned rest area. Corridor G avoids the Williamson Road/Stacey Lane residential area.

Concerns with respect to Corridor G are the same as Corridor F. Although the Williamson Road/Stacey Lane area and the Old Port Petroleum site would be avoided, additional concerns include potential involvement with the North DeSoto Parish Middle and High schools located on US 171.

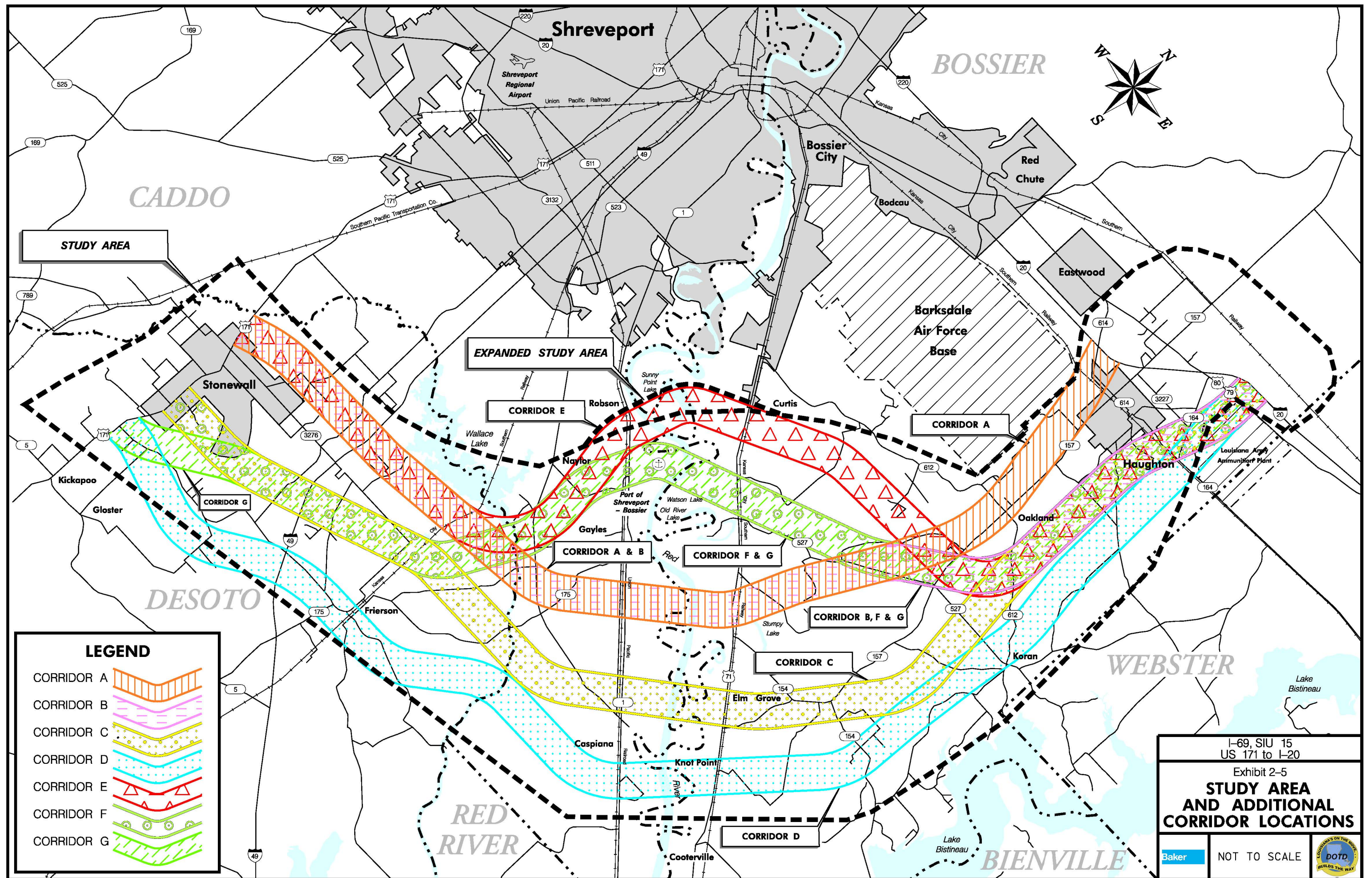


Table 2-2 ADDITIONAL CORRIDOR INVENTORY COMPARISON (Values Shown Are An Inventory of Resources Within The Entire 1-Mile Wide Corridor Actual Highway Impacts Would Be Substantially Less)							
Category	Original Corridors				Additional Corridors		
	A	B	C	D	E	F	G
Corridor Length (miles)	30.2	33.4	37.0	40.3	35.5	35.0	35.9
Structures							
<i>Residences</i>	254	182	147	127	197	220	213
<i>Mobile Homes</i>	245	194	196	136	211	282	285
<i>Apartment Buildings</i>	-	-	1	-	-	1	1
<i>Businesses</i>	17	13	9	14	16	18	16
<i>Churches</i>	6	5	2	6	4	5	5
<i>Public Facilities</i>	-	1	-	3	-	1	4
Total Structures	522	395	355	286	428	527	524
Cemeteries	2	1	3	3	2	2	2
Parks	-	-	-	-	-	-	-
Natural Resources							
<i>Wetlands (acres)</i>	916	962	1,124	2,019	1,307	1,224	1,197
<i>Known Threatened or Endangered Species Locations</i>	-	-	1	1	-	-	-
<i>100-Year Floodplain (acres)</i>	6,300	6,176	6,306	7,779	5,500	5,155	5,398
<i>Conservation Reserve Program Areas (acres)</i>	-	-	-	-	86	-	-
<i>Wetland Reserve Program Areas (acres)</i>	-	-	-	666	-	-	-
Cultural Resources (Sites with Caddoan components shown in parentheses)							
<i>NRHP Listed Sites</i>	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
<i>Recorded Potentially Eligible Sites</i>	5 (4)	6 (4)	8 (2)	4 (2)	4 (1)	9 (3)	9 (3)
<i>Recorded Ineligible Sites</i>	3 (2)	2 (-)	6 (-)	8 (-)	6 (-)	19 (-)	19 (-)
Prehistoric Archaeology Probability Areas							
<i>Red River Alluvial Valley</i>							
<i>High (acres)</i>	516	516	540	439	1,098	980	980
<i>Medium (acres)</i>	3,240	3,240	2,758	2,496	4,656	3,832	3,832
<i>Low (acres)</i>	2,147	2,147	3,038	4,106	1,774	1,699	1,699
<i>Upland Areas</i>							
<i>High (acres)</i>	606	816	422	1,332	933	474	474
<i>Medium (acres)</i>	951	1,063	707	1,137	1,109	782	898
<i>Low (acres)</i>	9,270	10,531	12,976	11,854	12,591	14,098	14,590
Engineering Issues (Ranked 1 through 4 with 1 being the best satisfied)							
<i>Red River Bridge Crossing / LA 1 & US 71 Interchanges</i>	3	3	1	2	3	1	1
<i>US 171 Interchange</i>	3	3	1	2	3	1	2
<i>I-49 Interchange</i>	2	2	1	4	2	1	1
<i>I-20 Interchange</i>	4	1	1	1	1	1	1
Proximity to the Port of Shreveport-Bossier (Ranked 1 through 4 with 1 being the best satisfied)	2	2	3	4	1	1	1
Wellhead Protection Areas	4	5	5	2	5	5	5
Known Hazardous Materials Sites	2	3	1	3	2	3	3
Oil and (Gas) Wells							
<i>Producing</i>	1 (39)	- (26)	- (29)	- (10)	- (5)	- (15)	- (13)
<i>Shut In</i>	1 (9)	- (1)	- (5)	- (1)	1 (5)	- (1)	- (1)
<i>Active Injection</i>	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)

Source: Michael Baker Jr., Inc., 2002

2.3.7 Additional Corridor Studies Outreach

After development of the environmental inventory within the Expanded Study Area, development of the additional corridors, and subsequent corridor comparison analyses, meetings were held with resource agencies, local officials, and the public to present the results of the Additional Corridor Studies and to obtain input on the additional corridors developed.

Agency Involvement

Federal and state agencies were invited to participate in an April 2, 2002 agency coordination meeting to review the Expanded Study Area environmental inventory and the additional corridors developed. The FWS indicated that large forested tracts should be avoided due of the potential for Red-cockaded woodpecker (RCW) habitat. No known RCW habitat has been documented in the Study Area. The U.S. Army Corps of Engineers (COE) indicated that the Red River bridge location accommodates navigation concerns. The COE also indicated that frontage road and secondary and cumulative impacts be evaluated.

Native American Tribe Involvement

Correspondence inviting tribal participation at the April 2, 2002 agency coordination meeting was sent to the Caddo Nation of Oklahoma, the Mississippi Band of Choctaw Indians, and the Quapaw Tribe of Oklahoma. This letter requested the identification of any issues or areas of

traditional religious and cultural importance that should be considered during the development of project alternatives. The FHWA also unsuccessfully attempted to contact the Caddo Nation of Oklahoma via telephone to solicit meeting participation. Messages left via answering machine were not returned. No correspondence was received from any tribe identifying specific concerns.

Local Officials Involvement

Local officials were invited to participate in an April 2, 2002 local officials meeting to review the additional corridors developed. Concerns included proximity to metropolitan areas and the Port of Shreveport-Bossier, and potential compatibility with a future parallel rail corridor.

Public Involvement

Nearly 500 people attended the public meetings held April 2 and April 3, 2002 and over 40 written comment forms were received. Ten additional comments were received via a project-specific Internet web site. Public concern continued to be the proximity to and potential loss of personal property. Most comments favored Corridors A, B or E.

2.3.8 Additional Corridor Revisions

Additional Corridor Revisions Outreach

Following the April 2002 outreach meetings, the Port informed the DOTD that Corridors F and G pass through the largest contiguous tract of

property owned by the Port. The Port expressed their desire to retain this tract for potential future development. This information was not included with information previously provided by the Port on their existing infrastructure and planned infrastructure improvements, nor was the issue raised at the April 2002 outreach meetings.

A June 5, 2002 meeting was held with the MPO, the Mayor of Shreveport, the Mayor of Bossier City, and the Port of Shreveport-Bossier to discuss the Port properties with respect to potential future development, and the additional corridors developed. The Port indicated that the highway corridor could pass through their property, but that it would be limited to an approximate 2,000-foot width south of and adjacent to Corridors F and G.

The Mayor of Shreveport indicated that the local officials in attendance at the January 30, 2002 local officials meeting favored a corridor north of the Port (Corridor E) and that Corridor E was still favored by the local officials. A June 13, 2002 letter signed by the City of Shreveport, the City of Bossier City, the Caddo/Bossier Port Commission and the MPO stated continued support for Corridor E as the corridor preferred by the local governing authorities (see Appendix F, page F-35).

Following the June 5, 2002 meeting, the federal cooperating agencies and the Caddo Nation of Oklahoma were contacted to solicit additional comments on the additional corridors developed

and presented at the April 2002 outreach meetings. Comments received are summarized below.

- ❑ **U.S. Fish and Wildlife Service** – No additional comments beyond what has already been provided through previous project coordination.
- ❑ **U.S. Coast Guard** – Concerns are with navigation. If the Red River crossing is constructed with no piers in the water, then there are no concerns with the crossing location. If river piers are used, then the crossing location and angle, the pier locations, and fendering are important considerations.
- ❑ **U.S. Army Corps of Engineers** – A preferred corridor should minimize wetland impacts. Corridors A, B and E are too close to Wallace Lake and development of those corridors could be problematic. Cultural resource impacts should also be minimized and the Elm Grove Oil and Gas Field should be avoided, if possible.
- ❑ **U.S. Environmental Protection Agency** – A preferred corridor should avoid or minimize wetland impacts consistent with Section 404 b(1). Potential secondary development impacts, particularly in wetlands and floodplains should be considered and project cost is a valid evaluation criterion in identifying a preferred corridor. Corridor C appeared most favorable at the December 2001 outreach meetings and

Corridor C is still a good selection. Corridors C, F and G have the least engineering issues. Corridor E has a higher likelihood for potential noise, neighborhood disruption, environmental justice, hazardous materials and relocation issues that could all be avoided by locating the highway further from the metropolitan area. A connector road could be provided for Port access. If a preferred corridor cannot be clearly identified, several corridors may need to be advanced for further study in order to quantify and qualify project impacts.

- ❑ **Caddo Nation of Oklahoma** – Avoid, if at all possible, any corridor that contains or has the potential to contain Caddoan archaeological sites. If not avoided, develop a plan in cooperation with the Caddo Nation to minimize and mitigate adverse effects to the sites and develop a Memorandum of Agreement stipulating the process for minimizing those effects.

Additional Corridor Revisions

Corridors F and G were revised to pass through the Port south of and adjacent to their original corridor locations in order to minimize encroachment on the largest contiguous tract of Port property. The Port expressed their desire to retain this tract for potential future development. These revised corridors are designated Corridors F_S and G_S and are shown in Exhibit 2-6. The corridors were

revised for a distance of approximately 3 miles between US 71 and Tones Bayou and the corridor width was reduced from 1 mile to approximately 2,000 feet, consistent with Port directives.

Table 2-3 presents a Preliminary Corridor Inventory Comparison of the four original corridors (A, B, C, and D) and the three additional corridors (E, F_S, and G_S) developed. The values shown for each corridor are the resources within the entire corridor width, which in all cases, except for Corridors F_S and G_S through the Port, is 1-mile wide. Actual highway impacts for a roadway of approximately 300 feet in width would be substantially less.

2.3.9 Corridor Screening

The objective of the Corridor Studies phase was to identify a corridor, or combination of corridor segments, as part of the planning process that represents the best opportunity to develop highway alignments within it that avoids or minimizes impacts to the social, natural, and cultural environments and that best meets the project Purpose and Need. A corridor segment is a portion of a corridor, which when combined with other corridor segments, creates a new corridor. It is unlikely that one corridor, or combination of corridor segments, represents the *least* potential impact to all resource categories. The information collected and evaluated during the Corridor Studies phase, combined with the involvement of the resource

agencies, Native American tribes, local officials, and the public, was sufficient to advance a Preferred Corridor to the Alignment Study.

Following the additional corridor studies public outreach meetings and additional corridor revisions coordination, the four original and three additional corridors were evaluated with respect to potential impacts to social, natural, and cultural resources, and engineering considerations. All corridors would have environmental impacts. Of the resources studied, the project would ultimately have the greatest affect on residences, floodplains, and wetlands. Impacts to businesses, churches, public facilities, and cultural resources would occur to a lesser extent and in some areas, could be avoided entirely.

Social and Economic Considerations

The most important corridor-screening criterion identified by the public and local officials was the ability to reduce and avoid residential and business displacements.

Concerns were expressed by the Mayor of Shreveport, the Chamber, and the Port regarding economic development and the loss of economic opportunities if the highway was located too far from the Shreveport/Bossier City metropolitan area and intermodal connectivity with the Port of Shreveport-Bossier.

Natural Resources Considerations

To help slow and minimize wetland losses nationwide, Executive Order 11990 (EO 11990, May 1977) "Protection of Wetlands", established a national policy to "avoid to the extent possible the long-term and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative". Wetlands are regulated by the COE and are primarily associated with rivers, streams, and bayous in the Study Area.

Authorized by Congress under the Food Security Act of 1985, as amended, the Wetlands Reserve Program (WRP) is a voluntary program to restore and protect wetlands on private property. It provides the opportunity for landowners to receive financial incentives to enhance wetlands in exchange for retiring marginal agricultural land. The program involves long-term easements that limit future land use. A large WRP area is located between US 71 and LA 154, east of Elm Grove and Knot Point.

Executive Order 11988, Floodplain Management; 23 CFR Part 650, Location and Hydraulic Design of Encroachments on Floodplains; and US DOT 5650.2, Floodplain Management and Protection require the protection of floodplains and floodways.

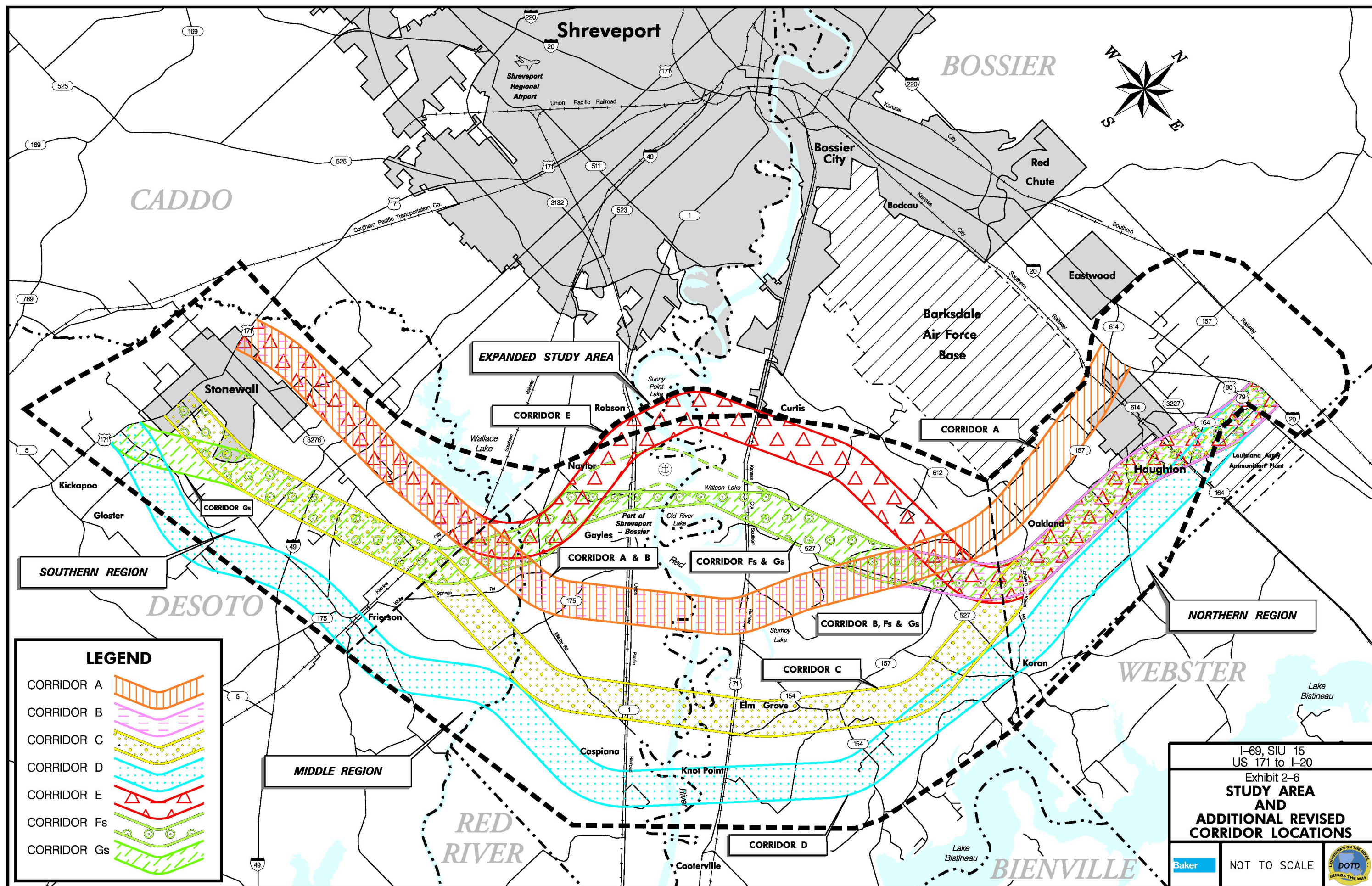


Table 2-3 PRELIMINARY ADDITIONAL REVISED CORRIDOR INVENTORY COMPARISON (Values Shown Are An Inventory of Resources Within The Entire 1-Mile Wide Corridor Actual Highway Impacts Would Be Substantially Less)							
Category	Original Corridors				Additional Revised Corridors		
	A	B	C	D	E	Fs	Gs
Corridor Length (miles)	30.2	33.4	37.0	40.3	35.5	34.5	35.5
Structures							
Residences	254	182	147	127	197	215	209
Mobile Homes	245	194	196	136	211	282	285
Apartment Buildings	-	-	1	-	-	1	1
Businesses	17	13	9	14	16	17	15
Churches	6	5	2	6	4	6	5
Public Facilities	-	1	-	3	-	1	4
Total Structures	522	395	355	286	428	522	519
Cemeteries	2	1	3	3	2	1	1
Parks	-	-	-	-	-	-	-
Natural Resources							
Wetlands (acres)	916	962	1,124	2,019	1,307	728	701
Known Threatened or Endangered Species Locations	-	-	1	1	-	-	-
100-Year Floodplain (acres)	6,300	6,176	6,306	7,779	5,500	4,202	4,445
Conservation Reserve Program Areas (acres)	-	-	-	-	86	-	-
Wetland Reserve Program Areas (acres)	-	-	-	666	-	-	-
Cultural Resources (Sites with Caddoan components shown in parentheses)							
NRHP Listed Sites	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
Recorded Potentially Eligible Sites	5 (4)	6 (4)	8 (2)	4 (2)	4 (1)	3 ()	3 ()
Recorded Ineligible Sites	3 (2)	2 (-)	6 (-)	8 (-)	6 (-)	2 ()	2 ()
Prehistoric Archaeology Probability Areas							
Red River Alluvial Valley							
High (acres)	516	516	540	439	1,098	646	646
Medium (acres)	3,240	3,240	2,758	2,496	4,656	2,658	2,658
Low (acres)	2,147	2,147	3,038	4,106	1,774	1,429	1,429
Upland Areas							
High (acres)	606	816	422	1,332	933	471	471
Medium (acres)	951	1,063	707	1,137	1,109	780	898
Low (acres)	9,270	10,531	12,976	11,854	12,591	14,108	14,613
Engineering Issues (Ranked 1 through 4 with 1 being the best satisfied)							
Red River Bridge Crossing / LA 1 & US 71 Interchanges	3	3	1	2	3	2.5	2.5
US 171 Interchange	3	3	1	2	3	2	2
I-49 Interchange	2	2	1	4	2	1	1
I-20 Interchange	4	1	1	1	1	1	1
Proximity to the Port of Shreveport-Bossier (Ranked 1 through 4 with 1 being the best satisfied)	2	2	3	4	1	0.5	0.5
Wellhead Protection Areas	4	5	5	2	5	5	5
Known Hazardous Materials Sites	2	3	1	3	2	3	3
Oil and (Gas) Wells							
Producing	1 (39)	- (26)	- (29)	- (10)	- (5)	- (14)	- (12)
Shut In	1 (9)	- (1)	- (5)	- (1)	1 (5)	- (-)	- (-)
Active Injection	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)

Source: Michael Baker Jr., Inc., 2002

These regulations were designed to minimize highway encroachments within the 100-year floodplain and to avoid land use development inconsistent with floodplain values.

Section 7 of the Endangered Species Act ensures that activities authorized by federal agencies consider the potential impacts to threatened or endangered species and their critical habitats. Nesting sites of the Interior least tern, a federally listed endangered species have been documented in the Study Area.

The Nature Conservancy of Louisiana has identified a large tract of bottomland hardwood forest associated with Cannisnia Lake south of Caspiana as one of the most important remnant natural areas in Caddo and Bossier Parishes and the largest remaining forested wetland in the Northern Red River Valley.

Cultural Resources Considerations

Section 106 of the National Historic Preservation Act of 1966 protects those properties that are listed in or eligible for listing in the National Register of Historic Places.

The Caddo Nation of Oklahoma expressed concern regarding avoidance of and impacts to archaeological sites of Caddo significance, and indicated that areas of high and moderate probability for archaeological potential combined with the locations of known archaeological sites would be useful in evaluating the developed

corridors. The Caddo Nation also indicated that the Red River Alluvial Valley would be an important resource area.

Engineering Considerations

The bridge crossing the Red River and the adjacent interchanges at US 71 and LA 1 are the project's most significant challenge and costly feature. Issues include navigation, river width and crossing angle, and the ability to develop a two-quadrant interchange on the riverside of LA 1 and US 71 while satisfying highway design criteria.

Corridors A and B cross the Red River at a bend, which could affect navigation. The Red River is currently navigable to the I-220 bridge crossing. A crossing at Corridor E could pose navigation concerns should the navigable waterway be expanded further north. Corridors C and D cross in a relatively straight section of the river.

Of the corridors developed, the river is the narrowest at the Corridors A and B crossing location, which would result in the shortest bridge length. Corridors A, B, C, and D have a nearly perpendicular crossing. Corridors E, F_s and G_s cross the river at an angle, further increasing the bridge length. Also, the limited distance between the protection levee and LA 1 at Corridor E presents additional challenges in satisfying highway design criteria and developing an interchange at LA 1 while maintaining the required

vertical clearance over the protection levee. A river crossing in Corridor E may require levee relocation.

An interchange connection with I-20 is currently provided at LA 157 and a system-to-system interchange is proposed with the I-69 project. Corridor A would have an interchange approximately 1.25 miles west of the existing interchange with LA 157. The remaining corridors would have an interchange approximately 3 miles east from the existing LA 157 interchange.

Potential point of access issues exist with locating a system-to-system interchange at the Corridor A location with I-20 due to the close proximity to the LA 157 interchange. Impacts to the Barksdale Air Force Base would result if the interchange were located further west of the LA 157 interchange.

Interchange connections with I-49 are currently provided at LA 3276 and LA 175 and a system-to-system interchange is proposed with the I-69 project. Corridors A, B, and E would have an interchange approximately 1 mile north of the existing interchange with LA 3276. The Corridors C, F_S and G_S interchange is approximately 1.5 miles south from the existing LA 3276 interchange and approximately 4 miles north from the existing LA 175 interchange. The Corridor D interchange is approximately 2 miles north from the existing LA 175 interchange.

Potential point of access issues exist with locating a system-to-system interchange at I-49 at the

Corridors A, B, and E location due to the close proximity to the LA 3276 interchange. In addition, this interchange cannot be located further north of the LA 3276 interchange due to potential secondary and cumulative development impacts to the floodplain associated with the Wallace Lake tributaries. The Corridor D location could result in potential secondary and cumulative development impacts to the floodplain associated with Brushy Bayou.

Corridors and Corridor Segments Eliminated from Further Consideration

After a thorough review of all resources and input from the public, local officials, Native American tribes and agency involvement, it was recommended that a combination of corridor segments be carried forward into the Alignment Studies phase as the Preferred Corridor. Based on the evaluation with respect to potential impacts to social, natural, cultural resource, and engineering considerations above, no additional corridors or corridor segments warranted consideration.

Utilizing the corridors developed and the ability to combine corridor segments to avoid or minimize impacts to the social, natural, and cultural environment while satisfying the project Purpose and Need, corridor screening was evaluated within three general geographic regions (see Exhibit 2-6):

- ❑ Northern Region – northern terminus to approximately Johnson – Koran Road

- ❑ Middle Region – Johnson – Koran Road to approximately the Kansas City Southern (KCS) Railroad line east of Stonewall Frierson Road
- ❑ Southern Region - KCS Railroad line east of Stonewall Frierson Road to the southern terminus.

The bridge crossing the Red River and the adjacent interchanges at US 71 and LA 1, the project's most significant challenge and costly feature, are located in the Middle Region.

Northern Region

Corridor A was eliminated from further consideration due to increased potential residential and business impacts along LA 614 and north of I-20 in SIU 14 and due to the close proximity of the existing I-20/LA 157 interchange. This corridor segment would not allow the development of highway alignments that could minimize displacements in any appreciable manner.

The Corridor D segment was eliminated from consideration as a viable segment for further study due to unavoidable environmental impacts to floodplains, wetlands, potential archaeological sites, and terrestrial habitat. This segment would potentially have multiple crossings, longitudinal floodplain impacts, and a high probability of involvement with unrecorded archaeological sites associated with Clark Bayou.

The remaining corridors (Corridors B, C, E, F_s, and G_s) are coincident in the Northern Region of the project. For simplicity, it was recommended that Corridor G_s be carried forward into the Alignment Studies phase as the Preferred Corridor within the Northern Region.

Middle Region

The Red River bridge crossing and the adjacent interchanges at US 71 and LA 1 are the project's most significant challenge and costly feature. Issues include navigation, river width and crossing angle, and the ability to develop a two-quadrant interchange on the riverside of LA 1 and US 71 while satisfying highway design criteria. The Middle Region, which encompasses the Red River Alluvial Valley, contains the majority of the Study Area wetlands, floodplains, and oil and gas wells. The Red River Alluvial Valley also contains the majority of the areas designated as high or medium probability for prehistoric archaeological resources.

The Corridor A segment was eliminated from further consideration because it does not connect well with the preferred corridor segment identified in the Northern Region.

The Corridor D segment was eliminated from further consideration because it would impact a large WRP conservation area that completely spans and extends beyond the corridor. The corridor also passes through bottomland hardwood forest associated with Cannisnia Lake, which was

identified by the Nature Conservancy of Louisiana as one of the most important remnant natural areas in Caddo and Bossier Parishes and the largest remaining forested wetland in the Northern Red River. The corridor is also the farthest from the Shreveport/Bossier City metropolitan area and the Port.

The remaining corridor segments within the Middle Region were evaluated with respect to potential

displacements and impacts to wetlands, floodplains, prehistoric archaeological resources probability areas, and oil and gas wells, as well as engineering considerations. These resources were identified during scoping, and ongoing coordination, as the most important screening criteria. The corridor segment inventory comparisons are shown in Table 2-4 and the engineering considerations are shown in Table 2-5.

Table 2-4
CORRIDOR SEGMENT INVENTORY COMPARISON – MIDDLE REGION
*(Values Shown Are An Inventory of Resources Within The Entire 1-Mile Wide Corridor
Actual Highway Impacts Would Be Substantially Less)*

Category	Corridor Segment			
	B	C	E	F _s /G _s ¹
Structures				
<i>Residences</i>	87	42	90	81
<i>Mobile Homes</i>	71	26	85	112
<i>Apartment Buildings</i>	-	-	-	-
<i>Businesses</i>	6	2	6	8
<i>Churches</i>	2	-	1	2
<i>Public Facilities</i>	1	-	-	1
Total Structures	167	70	182	204
Cemeteries	-	2	-	-
Natural Resources				
<i>Wetlands (acres)</i>	777	940	1,098	548
<i>100-Year Floodplain (acres)</i>	5,694	6,144	4,886	3,919
Prehistoric Archaeology Probability Areas				
<i>Red River Alluvial Valley</i>				
<i>High (acres)</i>	515	540	1,098	646
<i>Medium (acres)</i>	3,240	2,758	4,640	2,658
<i>Low (acres)</i>	2,147	3,038	1,835	1,429
<i>Upland Areas</i>				
<i>High (acres)</i>	277	212	235	261
<i>Medium (acres)</i>	517	400	444	461
<i>Low (acres)</i>	5,033	6,320	5,071	4,946
Oil and (Gas) Wells				
<i>Producing</i>	- (29)	- (27)	- (8)	- (10)
<i>Shut In</i>	- (1)	- (5)	1 (5)	- (1)
<i>Active Injection</i>	- (-)	- (-)	- (-)	- (-)

Source: Michael Baker Jr., Inc., 2002

¹ – Corridor Segment width reduced through Port area.

**Table 2-5
CORRIDOR SEGMENT ENGINEERING COMPARISON – MIDDLE REGION**

Engineering Consideration (Listed by Importance)	Corridor Segment Ranking (Ranked 1 through 4 with 1 being the best)			
	B	C	E	Fs/Gs
Red River Crossing Location (Navigation)	4	1	2	3
Distance Between Levees	1	3	4	2
Interchange Location (LA 1 & US 71)	3	1	4	2
Preliminary Cost	1	3	4	2
Proximity to Shreveport/Bossier City	3	4	1	2
Proximity to Port of Shreveport-Bossier	3	4	2	1
Corridor Segment Length (To Common Point)	1	3	4	2
Potential for Future Railroad Corridor	2	1	4	3
Totals	18	20	25	17

Source: Michael Baker Jr., Inc., 2002

Stakeholder consensus could not be reached on a preferred corridor location within the Middle Region. The local officials preferred Corridor E because of its close proximity to the Shreveport metropolitan area and the Port of Shreveport-Bossier. The resource agencies preferred a corridor that minimizes potential impacts to wetlands, floodplains, and cultural resources. The Corridor E segment has the highest inventory of wetlands and high/medium probability for archaeological resources. In contrast, the Corridor C segment has the lowest inventory of high/medium probability for archaeological resources but is the farthest from the Port and the metropolitan area.

The Corridor C segment was eliminated from further consideration due to its proximity to the Shreveport/Bossier City metropolitan area and the Port of Shreveport-Bossier. The Mayor of Shreveport, the Chamber, and the Port expressed concern regarding the loss of economic

development and intermodal connectivity opportunities should Corridor C be advance for further study. The corridor inventory includes an Interior least tern nesting site and the highest number of producing gas wells.

The Corridor E segment was also eliminated from further consideration. Although the corridor segment is the closest to the Shreveport/Bossier City metropolitan area, its angled crossing in a wide section of the Red River will increase the bridge length. Also, limited distance between the protection levee and LA 1 at Corridor E may present additional challenges in satisfying highway design criteria and developing an interchange at LA 1 while maintaining the required vertical clearance over the protection levee. Levee relocation may be required. The Red River is currently navigable to the I-220 bridge crossing. The crossing at the bend in the river could pose navigation concerns should the navigable waterway be expanded further north. The Corridor E

segment also has the highest inventory of wetlands, a federally regulated resource, and areas of high and medium probability for prehistoric archaeological resources.

Corridors F_S and G_S are coincident in the Middle Region of the project. For simplicity, it was recommended that Corridor G_S be carried forward into the Alignment Studies phase as the Preferred Corridor within the Middle Region.

In addition to Corridor G_S, it was also recommended that the Corridor B segment be carried forward into the Alignment Studies phase as the Preferred Corridor within the Middle Region. The Corridor G_S segment has the least involvement with wetlands and floodplains, nearly the least involvement with prehistoric archaeological high/medium probability areas, and is ranked best overall for engineering considerations. The Corridor G_S segment is within the Port and is in close proximity to the metropolitan area. However, the Corridor G_S segment does have the highest standing structures inventory. The Corridor B segment has the next lowest involvement with wetlands, and does not contain the highest inventory of floodplains and prehistoric archaeological high/medium probability areas. The Corridor B segment has a low standing structures inventory, is located at the southern end of the Port and is ranked second for engineering considerations. In order to provide a smooth transition with Corridor G_S, the Corridor B segment

was realigned between Ellerbe Road and White Springs Road.

Southern Region

The Corridors A, B, and E segments are coincident in the Southern Region of the project and were eliminated from further consideration because an interchange with I-49 at this location could pose possible point of access issues with the existing I-49/LA 3276 interchange and potential secondary and cumulative development impacts to the floodplain associated with the Wallace Lake tributaries. The COE indicated that these corridor segments are too close to Wallace Lake and that highway development within these corridor segments could be problematic.

The Corridor D segment was eliminated from further consideration because the location could result in potential secondary and cumulative development impacts to the floodplain associated with Brushy Bayou. Also, the corridor segment does not connect well with the preferred corridor identified in the Middle Region.

The Corridor C and F_S segments are coincident in the Southern Region of the project and were eliminated from further consideration because the corridor segments would involve the Williamson Road/Stacey Lane residential area, and the Old Port Petroleum facility.

It was recommended that the Corridor G_S segment be carried forward into the Alignment Studies

phase as the Preferred Corridor within the Southern Region. The corridor segment is similar to the Corridor C and F_S segments but proceeds further south of Stonewall, avoiding the Williamson Road/Stacey Lane residential area, and the Old Port Petroleum facility.

2.3.10 The Preferred Corridor for Interstate 69, SIU 15

Of all of the corridors developed, a Preferred Corridor comprised of Corridor G_S in its entirety along with a segment of Corridor B through the Red River Alluvial Valley, best balances the social, natural, cultural resources, and engineering considerations with the national, regional and local benefits expected from the project. The Preferred Corridor, shown in Exhibit 2-7, provides the opportunity for economic development and intermodal connectivity identified by local officials. It avoids the Williamson Road/Stacey Lane residential area and the Old Port Petroleum solid waste site identified by the public. The Preferred Corridor crosses the Red River at the narrowest locations of all of the corridors developed, would result in the shortest bridge length, and provides sufficient clearance to develop an interchange between the protection levee and LA 1. The proposed interchange location with I-49 avoids potential point of access issues with adjacent interchanges and secondary and cumulative development impacts to area floodplains.

The Preferred Corridor has the least potential involvement with wetlands, nearly the least potential involvement with floodplains and areas of high/medium probability for prehistoric archaeological resources, does not have the greatest inventory in any natural resources inventory category, and does not involve known threatened or endangered species locations. Alignment development can avoid or minimize displacements and impacts to known archaeological sites.

The identification of the Preferred Corridor satisfies, to the fullest extent possible, the objectives of the merged NEPA/404 process that have been adopted for the project. The wetlands inventory within the Preferred Corridor is neither the highest nor the lowest. Area wetlands are primarily associated with rivers, streams and bayous.

An October 30, 2002 meeting was held with the MPO's Transportation Policy Committee to discuss the additional corridor revisions and the corridor screening process. The Transportation Policy Committee agreed that a preferred corridor comprised of Corridor G_S in its entirety along with a segment of Corridor B through the Red River Alluvial Valley, best balanced the environmental and engineering considerations with the benefits expected from the project. An October 30, 2002 Resolution adopted by the MPO supports this preferred corridor recommendation (see Appendix F, page F-47). In addition to the

MPO Resolution, separate letters were received from those local governing authorities comprising the Transportation Planning Committee, supporting the preferred corridor recommendation. A corridor recommendation was submitted to the federal cooperating agencies (COE, FWS, U.S. Coast Guard (USCG), and EPA), other participating federal and state resource agencies and Native American Tribes. The corridor recommendation detailed the corridor studies process, provided the rationale for selecting the Preferred Corridor, and requested written comments. The COE, FWS, USCG, and EPA concurred with the Preferred Corridor (see Appendix D, pages D-54 to D-59).

The identification of the Preferred Corridor does not preclude consideration of alignment development outside of the Preferred Corridor, if warranted, to avoid or further minimize social or environmental impacts.

2.4 ALIGNMENT STUDIES

The Alignment Studies consisted of a focused effort within the Preferred Corridor and included:

- ☐ Developing detailed project mapping – 1"=800' based on 1998 and 1999 aerial photography
- ☐ Updating or adding the following project GIS environmental information that included:
 - Existing and abandoned water well information
 - Potential historic standing structures survey

- Field delineated wetlands
- Streams and other water bodies information
- Standing structures survey as necessary to reflect recent and ongoing construction
- Site boundaries of known archaeological sites and cemeteries
- Preliminary property information collected from Bossier, Caddo, and DeSoto Parish courthouses

- ☐ Developing preliminary alignments and conceptual interchanges

- ☐ Conducting environmental field studies.

2.4.1 Design Features

The proposed highway would be a four-lane, divided, fully controlled access facility on new construction designed to Interstate standards. Access to the proposed facility would be limited to specific interchange locations, with grade separations at other crossroads. The roadway design criteria used during the alignment development are presented in Table 2-6.

Table 2-6 DESIGN CRITERIA		
Criteria	Value	
Design Speed	70 mph	
Median Width	90 ft	
	Maximum	Preferred
Profile Grade	3%	2%
Degree of Curve	2°	1°

Source: Michael Baker Jr., Inc.; DOTD; American Association of State Highway and Transportation Officials

Basic geometric features for the highway are presented in Exhibit 2-8. The highway typical section includes two 12-foot through lanes in either direction with a 90-foot median and inside and outside shoulders. Minor road realignments may be required to improve existing roadway geometry.

Access to the I-69 project would be limited to and provided at six proposed interchange locations along all of the alignments developed. Proposed interchange locations include I-20, LA 157, US 71, LA 1, I-49, and US 171.

AASHTO Interstate Design Standards (AASHTO 2005) and DOTD Engineering Directives (DOTD 2006) require a minimum interchange spacing of one mile in urban areas and three miles in rural areas. All alignments developed would require a Design Exception for the I-49 interchange, which is located in a rural area approximately 1.4 miles south of the existing I-49/LA 3276 interchange. Per DOTD requirements, the Design Exception would be requested during final design.

Grade separations are proposed at all major roadway and rail crossings. Overpass or underpass structures are proposed at the various crossings depending on the alignment and terrain. Line and grade for all alignments was established to meet or exceed minimum vertical clearance requirements over roadways and rail lines. Construction and maintenance agreements will be

coordinated as needed with the railroads during final design. Table 2-7 lists the grade separation locations and types for each alignment.

Crossovers would be provided for emergency access. The number and location of the emergency crossovers would be determined during final design.

2.4.2 Alignment Development

The Preferred Corridor was divided into three discrete sections to allow a more detailed analysis of potential impacts. Section 1 begins at US 171 and extends northward to the Kansas City Southern Railway (KCS) line at Frierson in DeSoto Parish, a distance of approximately 9.1 miles. Section 2N and Section 2S are the northern and southern routes of the Preferred Corridor respectively, and include the Red River crossing. These sections extend from the KCS line at Frierson to LA 157 in Bossier Parish. Section 2N and Section 2S are approximately 15.9 and 15.4 miles in length, respectively. Section 3 begins at LA 157 and extends northward to I-20, a distance of approximately 10.6 miles.

Four distinct highway alignments were developed within the Preferred Corridor and are identified as Line 1, Line 2, Line 3, and Line 4. Within some reaches, two or more alignments may be in the same location due to environmental or engineering constraints in that reach of the Preferred Corridor.

**Table 2-7
PROPOSED INTERCHANGES AND GRADE SEPARATIONS**

Intersecting Roadway or Rail Line	Alignment					
	Line 1	Line 2	Line 3	Line 4	Line 5	Line 6 (DEIS Preferred) / Selected
U.S. 171	O (I)	O (I)	O (I)	O (I)	O (I)	O (I)
Linwood Avenue	U	U	U	U	U	U
Interstate 49	O (I)	O (I)	O (I)	O (I)	O (I)	O (I)
Bethel Road	U	U	U	U	U	U
Stonewall Frierson Road	O	O	O	O	O	O
Kansas City Southern Railway	O	O	O	O	O	O
White Springs Road	-	U	-	U	U	-
Ellerbe Road	U	U	U	U	U	U
LA 175	-	U	-	U	U	-
Union Pacific Railroad	O	O	O	O	O	O
LA 1	O (I)	O (I)	O (I)	O (I)	O (I)	O (I)
U.S. 71	O (I)	O (I)	O (I)	O (I)	O (I)	O (I)
Kansas City Southern Railway	O	O	O	O	O	O
Smith Road	-	U	-	U	U	-
Goat Hill Road	U	-	U	-	-	U
Pine Hill Road	O	-	O	-	-	O
LA 527	-	O	-	O	O	-
LA 157	U (I)	U (I)	U (I)	U (I)	U (I)	U (I)
Johnson-Koran Road	U	U	U	U	U	U
Oliver Road	U	U	U	U	U	U
Camp Zion Road	U	U	U	U	U	U
Kansas City Southern Railway	O	O	O	O	O	O
LA 614	O	O	O	O	O	O
LA 164	-	U	-	U	-	-
U.S. 79 / U.S. 80	O	O	O	O	O	O
Interstate 20	O (I)	O (I)	O (I)	O (I)	O (I)	O (I)

Source: Michael Baker Jr., Inc.

O = Overpass – Proposed highway would cross over existing road or rail line

U = Underpass – Existing road would cross over proposed highway

(I) = Proposed Interchange location

The alignments also cross and intersect at various points which allows potential crossovers from one alignment to another. A brief description of the alignments and environmental and engineering issues follows.

Section 1 Alignments

All alignments begin with an interchange at US 171 south of Stonewall and maintain a common alignment until passing east of Jessie Latin Road. From this point, Line 1 becomes the northernmost and Line 3 the southernmost alignment. Lines 2 and 4 continue on a common alignment. The alignments are roughly parallel to each other as they cross Linwood Avenue and I-49.

A fully directional interchange with I-49 is proposed for all alignments. The number and location of residences along Red Bluff Road and the proximity of the existing I-49/LA 3276 interchange with the proposed I-49/I-69 interchange influenced alignment development in this area.

The alignments continue in a parallel manner east of I-49, until Line 1 turns more southward, crosses Lines 2 and 4, and roughly follows Line 3. All alignments cross Stonewall Frierson Road and the KCS rail line. The number and location of residences along Stonewall Frierson Road and the intersecting side streets influenced alignment development in this area.

Section 2N Alignments

East of Frierson, Lines 1 and 3 turn northward to avoid 2 lakes west of White Springs Road and south of Wallace Bayou, with Line 3 continuing north of Line 1. Both alignments cross Wallace Bayou and Ellerbe Road, and converge prior to crossing Bayou Pierre. The alignments remain on an identical alignment until crossing the Union Pacific Railroad and LA 1. A two-quadrant interchange at LA 1 is proposed for both alignments in order to avoid impacts to the adjacent Union Pacific Railroad line. The two lakes within the Preferred Corridor influenced alignment development in this area.

Lines 1 and 3 proceed northeastward, crossing properties owned by the Port of Shreveport-Bossier and the Red River. The alignments diverge east of the Red River, with Line 1 proceeding slightly south of Line 3 as they cross US 71. A two-quadrant interchange is also proposed for both alignments at US 71 in order to avoid impacts to the adjacent Kansas City Southern Railway line. Both alignments cross the Flat River, turn more easterly, and cross one another prior to reaching Red Chute Bayou. The alignments then turn more northward, crossing Goat Hill Road, Pine Hill Road, and LA 157. An interchange with LA 157 is proposed. Alignment development in this area was limited by the 2,000-foot width of Port of Shreveport-Bossier property that could be used for alignment

development and influenced by the residential development in the Pine Hill Road area.

Section 2S Alignments

East of Frierson, Lines 2 and 4 continue northeastward roughly parallel to each other and passing north of a subdivision off White Springs Road. The alignments then cross Wallace Bayou, turn more northerly, cross Bayou Pierre and pass through the Lucas Sludge Disposal Site. They remain roughly parallel as they cross the Union Pacific Railroad and LA 1. A two-quadrant interchange is proposed with LA 1 in order to avoid impacts to the adjacent Union Pacific Railroad line. Alignment development in this area was influenced by the residential development south of White Springs Road, the crossing of Bayou Pierre and the existing roadway infrastructure within the Lucas Sludge Disposal Site.

East of LA 1, Lines 2 and 4 cross one another, with Line 2 becoming more northerly as the alignments cross US 71. A two-quadrant interchange with US 71 is also proposed for both alignments in order to avoid impacts to the adjacent Kansas City Southern Railway line. The alignments cross again prior to crossing the Flat River and turn more northerly as they cross Red Chute Bayou. The alignments cross again as they cross LA 527 and turn more easterly as they cross LA 157. At this location, Line 2 is the northernmost of the four alignments and Line 4 is identical to Line 1. An interchange with LA 157 is also proposed for

Lines 2 and 4. Alignment development in this area was influenced by residential development in Elm Grove and Pine Hill Road areas.

Section 3 Alignments

From LA 157, the four alignments continue in a parallel, northeasterly direction, turning more northerly as they cross Foxskin Bayou, then turn north crossing Johnson-Koran Road, Oliver Road and Camp Zion Road. The alignments then turn slightly east crossing LA 614, LA 164, and Clarke Bayou, with Lines 1 and 3 passing east of Lines 2 and 4. The lines then turn north, crossing US 79/US 80 and I-20. A fully directional interchange with I-20 is proposed for all alignments. The number and location of residences and businesses along Johnson-Koran Road in Oakland, and in the Haughton area influenced alignment development in this area.

2.4.3 Navigation

In accordance with 23 USC 144(h), (23 CFR Section 650.805), the DOTD and FHWA have made a preliminary determination that U.S. Coast Guard (USCG) bridge permits are only required for portions of the alignments spanning the Red River. Bridge permits would not be required for the remaining portions of the alignments because they traverse waters that are not used, or are not susceptible to use in their natural condition or by reasonable improvement, as a means to transport interstate or foreign commerce. None of the waters within the Study Area are tidal induced. FHWA

determined that a U.S. Coast Guard (USCG) bridge permit is required for a waterway crossing on the Red River at Mile 212.2 and USGC bridge permits are not required for the following waterway crossings: Wallace Bayou, Chico Bayou, Bayou Pierre, Flat River, Red Chute Bayou, Foxskin Bayou, and Clark Bayou. The USCG concurred with FHWA's determination (see Appendix D, page D-174).

In their February 27, 2012 letter, the USCG indicated that a vertical navigation clearance of 62 feet above normal pool was required (see Appendix D, page D-176). All alternatives satisfy this requirement.

Pier locations, horizontal and vertical navigation clearances, and the alignment of the navigational openings for the proposed Red River bridge crossing were established in coordination with the U.S. Army Corps of Engineers and the U.S. Coast Guard and are presented in Section 2.5.3. Detailed navigation studies will be conducted and fendering or collision design alternatives will be established during final design.

2.4.4 Traffic Analysis

A preliminary traffic analysis was performed to evaluate and verify the serviceability of the highway system in 1999 and the design year 2030. Traffic volumes for I-20, I-220, US 71, US 171, I-49 and the proposed highway, as a stand-alone Section of Independent Utility (SIU) were obtained from the

study contractor that developed the traffic model for the entire I-69 Corridor. The traffic model was developed in 1999, which accounts for the 1999 traffic volumes. Due to the proximity of the preliminary alignments developed, traffic volumes were based on a representative Build Alternative on new location.

A capacity analysis was conducted to determine the design year 2030 Level of Service (LOS) for the No-Build and Build Alternatives within the Study Area and for the proposed highway (HCM 2000). The LOS is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Six LOS are defined, with letters designating each level, from A to F. LOS A represents the best operating conditions and LOS F the worst. Each level of service represents a range of operating conditions and the driver's perception of those conditions. Safety is not included in the measures that establish service levels.

Table 2-8 presents the capacity analysis results for the No-Build and Build Alternatives in 1999 and design year 2030. The analyses indicate that portions of I-20 and I-220 would operate at LOS D under both the No-Build and Build design year volumes.

Table 2-8 NO-BUILD AND BUILD ALTERNATIVES LEVEL OF SERVICE					
		Level of Service			
Roadway		1999 No-Build	1999 Build	2030 No-Build	2030 Build
I-20	West of I-220	B	B	D	D
I-20	East of I-220 and I-69	A	A	C	C
I-220	Between I-20 and US 71 (West of US 71)	C	C	C	C
I-220	Between I-20 and US 71 (East of US 71)	C	C	D	D
US 71	North of I-220	A	A	A	A
US 71	Between I-20 and I-69	-	A	-	A
US 71	South of I-69	-	A	-	A
US 171	Between I-20 and I-69	A	A	A	A
US 171	South of I-69	-	A	-	A
I-49	Between I-20 and I-69	A	A	A	A
I-49	South of I-69	-	A	-	A
I-69	West of US 171	-	A	-	A
I-69	Between US 171 and I-49	-	A	-	A
I-69	Between I-49 and US 71	-	A	-	A
I-69	Between US 71 and I-20	-	A	-	A
I-69	North of I-20	-	A	-	A

Source: Michael Baker Jr., Inc. 2003

These results are consistent with other traffic modeling studies performed in the region. US 171 and I-49 are projected to operate at LOS A under the No-Build and Build design year volumes, as would I-69 under the Build design year volumes.

2.4.5 Alignment Studies Outreach

After expanding the environmental inventory, developing preliminary alignments within the Preferred Corridor, and performing comparative

analyses and screening, meetings were held with the resource agencies, local officials, and the public to present the results of the Alignment Studies and to obtain input on the preliminary alignments developed.

Agency Involvement

Federal and state agencies were invited to participate in a July 23, 2003 agency coordination meeting to review the expanded environmental

inventory and the preliminary alignments developed. The U.S. Environmental Protection Agency (EPA) identified several areas where it may be possible to further minimize potential wetland impacts and requested that these areas be reevaluated.

In a separate letter, the FWS suggested that habitat surveys be conducted for the Interior least tern (*Sterna antillarum*) and the Red-cockaded woodpecker (*Picoides borealis*) prior to selecting an alignment. At a January 25, 2005 meeting, the DOTD, the FHWA, and the FWS agreed that biological assessments for the interior least tern (*Sterna antillarum*) and Red-cockaded woodpecker (*Picoides borealis*) would be conducted and that the Endangered Species Act (ESA) Section 7 consultations with the FWS would be completed prior to the issuance of the Final Environmental Impact Statement. Refer to Section 2.5.2 for a discussion of the final determinations.

A meeting was also held with representatives from the COE on August 19, 2003 to discuss the preliminary alignments, the potential wetland impacts, and field delineation methodology. The COE concurred with the field delineation methodology used.

A meeting was also held with representatives from the USCG and the COE on April 14, 2005 to discuss navigation studies for the Red River bridge crossing. It was agreed that a concept study would

be conducted on the Preferred Alignment Red River bridge crossing to determine span lengths and horizontal and vertical navigation clearances and the findings presented in the Final Environmental Impact Statement. Refer to Section 2.5.3 for a summary of the study.

Native American Tribe Involvement

Representatives from the Caddo Nation of Oklahoma, the Mississippi Band of Choctaw Indians, and the Quapaw Tribe of Oklahoma were invited to participate in the July 23, 2003 agency coordination meeting to discuss the preliminary alignments developed and to identify any issues or areas of traditional religious and cultural importance that should be considered during the alignment phase of study. No correspondence was received from any tribe identifying specific concerns.

Local Officials Involvement

Local officials were invited to participate in a July 22, 2003 local officials meeting to review the expanded environmental inventory and the preliminary alignments developed. In a separate letter, the Port expressed their support for an alignment crossing the Red River through Port property.

Public Involvement

Nearly 700 people attended the public meetings held July 22 and July 23, 2003 and nearly 100 written comment forms were received. Of those

nearly 100 written comment forms received, 59 were from members of the Caddo Rifle & Pistol Club. Public concern continued to be the proximity to and potential loss of personal property. Most comments favored Line 2 or Line 3. Members of the Caddo Rifle & Pistol Club favored Line 3 in Section 3 because it was the farthest from the range and would not interfere with shooting activities.

2.4.6 Alignment Revisions

Based on the comments received from the public, local officials, and the federal and state resource agencies following the July 2003 meetings, potential alignment revisions were studied and where feasible, were incorporated into the preliminary alignments. During this process, two additional alignments, Line 5 and Line 6 (along the southern and northern routes of the Preferred Corridor, respectively), were developed that combined portions of the four preliminary alignments. The only notable revisions were:

- ☐ Revise Line 1 and Line 3 in Section 2 to avoid a previously unidentified family cemetery
- ☐ Relocate LA 164 for Line 1, Line 3, Line 5 and Line 6 (Preferred Alignment) to create a T-intersection with LA 614, eliminating a bridge over LA 164 for those Lines

No other alignment adjustments to improve service or constructability or to further minimize impacts to sensitive environmental areas were identified.

These alignment adjustments will be subject to public, local officials, resource agency, and Native American tribe review during the Public Hearing and comment period on the Draft EIS.

Local Officials Involvement

A meeting was held with the Northwest Louisiana Council of Governments, Transportation Planning Committee (Shreveport-Bossier City area Metropolitan Planning Organization (MPO)) on January 20, 2004 to review alignment revision and development efforts since the July 2003 meetings. The MPO expressed their preference for an alignment resembling Line 5 in Section 1, Line 3 in Section 2, and Line 5 in Section 3. The MPO adopted a January 20, 2004 resolution supporting this alignment combination as the Preferred Alignment (see Appendix F, page F-58), which identified the following benefits:

- ☐ Ability to control right-of-way and right-of-way cost within the Port of Shreveport-Bossier area due to Port ownership
- ☐ Ability to control urban sprawl and the cost of other infrastructure needs to meet the facility
- ☐ Local government and planning commission ability to preserve the corridor through local development review processes
- ☐ Continued growth and development of the cities of Shreveport, Bossier City, Haughton, and Stonewall, Louisiana

- ❑ Enhanced access to the Port of Shreveport-Bossier
- ❑ Need for an additional Red River bridge crossing in the southern portions of Bossier and Caddo Parish and the proximity of this bridge to current development.

Line 6 is a combination of the alignment segments identified by the MPO.

In a separate February 17, 2004 letter, the Port expressed their continued support for an alignment crossing the Red River through Port property (see Appendix F, page F-65).

2.4.7 Preliminary Cost Analysis

The preliminary cost estimates prepared for the highway alignments include construction, right-of-way (ROW) acquisition, and utility relocation costs (see Table 2-9).

Table 2-9
COST ESTIMATE FOR PRELIMINARY ALIGNMENTS (IN YEAR 2005 \$)
(in 000s)

Cost	Line 1	Line 2	Line 3	Line 4	Line 5	Line 6 (DEIS Preferred)
Construction	\$ 505,198	\$ 497,338	\$ 512,694	\$ 496,430	\$ 498,183	\$ 505,372
ROW & Utilities	\$ 41,288	\$ 40,365	\$ 40,273	\$ 40,155	\$ 40,819	\$ 40,648
Total	\$ 546,486	\$ 537,703	\$ 552,967	\$ 536,585	\$ 539,002	\$ 546,020

Source: Michael Baker Jr., Inc.; DOTD. 2005

Construction costs include earthwork, grading, drainage, base and pavement, bridges, and a 15% engineering design, construction inspection and administrative expense. ROW costs include land acquisition, relocation expenses for residences, utility relocations, and a 40% ROW and utility administrative expense. Mitigation costs are not estimated at this time.

2.4.8 Preliminary Environmental Impact Analysis

Table 2-10 presents a comparison of the six preliminary alignments developed within the three sections with respect to important engineering and environmental parameters.

Line 3 would be the longest in length and most costly to construct. Lines 2 and 4 are the shortest in length and would be the least costly to construct.

Line 2 would have the fewest residential and overall structures impacts.

Line 2 would also have the second lowest amount of wetlands impacts. Line 2 would impact a known potentially eligible archaeology site containing possible Caddoan components but would have the least involvement with high/medium probability for archaeological resources.

Line 4 has the greatest wetland and floodplain impacts. It has the second lowest involvement with high/medium probability for archaeological resources.

Line 2 and Line 4 would impact properties owned by Yogie and Friends Exotic Cat Sanctuary in Frierson.

Line 1 has the greatest residential and overall structures impacts. Line 1 and Line 3 would also impact the new Elm Grove Baptist Church and would have the greatest impact with high/medium probability for archaeological resources, respectively. While Line 3 would have the least floodplain impacts, it would impact the Boomtown Grocery in Haughton.

Lines 1, 3, 5, and 6 (Preferred Alignment) would impact Carson's Auto Repair in Haughton.

2.4.9 Preferred Alignment Identified in the Draft EIS

As a result of the comprehensive involvement by the public, local officials, federal and state resource agencies, and Native American tribes, sufficient information and public opinion existed to identify Line 6 as the Preferred Alignment for the I-69 project. Line 6, the Preferred Alignment, is primarily a combination of the preliminary alignments initially developed.

The FHWA, the DOTD, and the Caddo-Bossier Parishes Port Commission entered into a Corridor Preservation Memorandum of Agreement (MOA) to preserve Commission land, in an unimproved state, along the route of the recommended preferred alignment subject to public, local officials, resource agency, and Native American tribe review and completion of the NEPA process. In the event that the alignment ultimately selected does not pass through Commission property, the MOA will terminate upon execution of the Record of Decision. The Corridor Preservation MOA is included in Appendix M.

The Preferred Alignment (Line 6) is presented in Exhibit 2-9 and is compared to the four original alignments and Line 5 with respect to potential impacts and estimated construction costs in Table 2-10. Exhibit 2-10 presents the alignment locations and the environmental resources considered throughout both corridor and alignment development. Resources such as archaeological sites and protected species locations are not shown to protect those resources.

Justification for the Preferred Alignment (Line 6) recommendation in each section of the project is provided in Table 2-11.

**Table 2-11
PREFERRED ALIGNMENT JUSTIFICATION**

Section	Location	Basis for Preference
1	US 171 to KSC Railway at Frierson	Minimizes impacts to wetlands associated with Brushy Bayou and wetland impacts overall. Minimizes residential impacts near Frierson Road.
2	KCS Railway at Frierson to LA 157	Minimizes wetland and floodplain impacts associated with the Red River. Minimizing producing oil and gas well impacts. Avoids impacts to known potentially eligible archaeology sites, including those with Caddoan components. Route preferred by the Northwest Louisiana Council of Governments, the regional Metropolitan Planning Organization.
3	LA 157 to I-20	Minimizes impacts to wetlands associated with Foxskin Bayou and wetland impacts overall.

Source: Michael Baker Jr., Inc.

In summary, the Preferred Alignment:

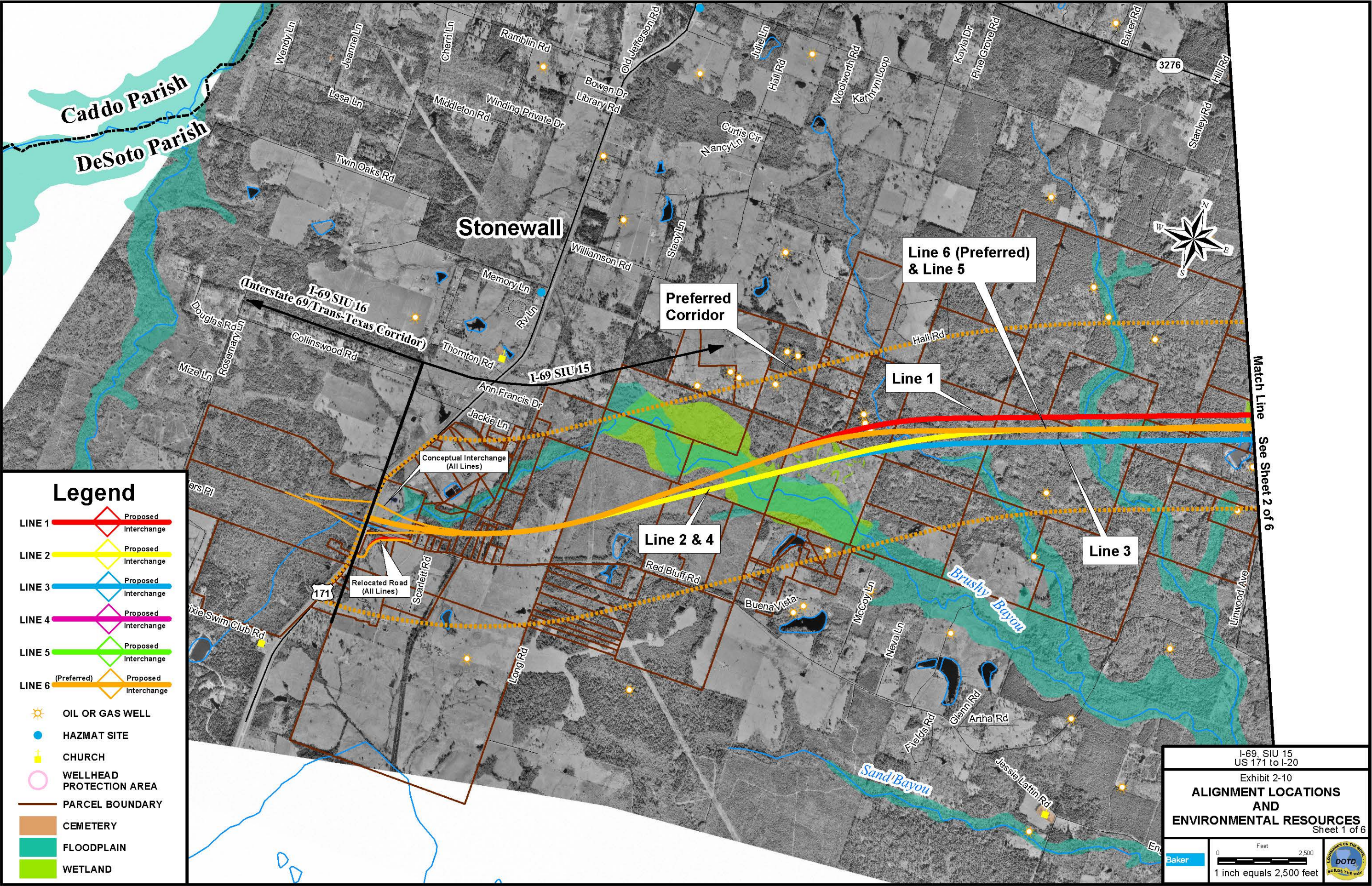
- ☐ Has the third lowest residential impacts
- ☐ Has the least wetland impacts
- ☐ Does not have the greatest involvement with areas of high/medium probability for prehistoric archaeological resources
- ☐ Does not have the greatest impact to other identified environmental resources
- ☐ Has a moderate estimated overall cost
- ☐ Is endorsed by the Northwest Louisiana Council of Governments, the regional Metropolitan Planning Organization
- ☐ Best balances the expected project benefits with the overall impacts.

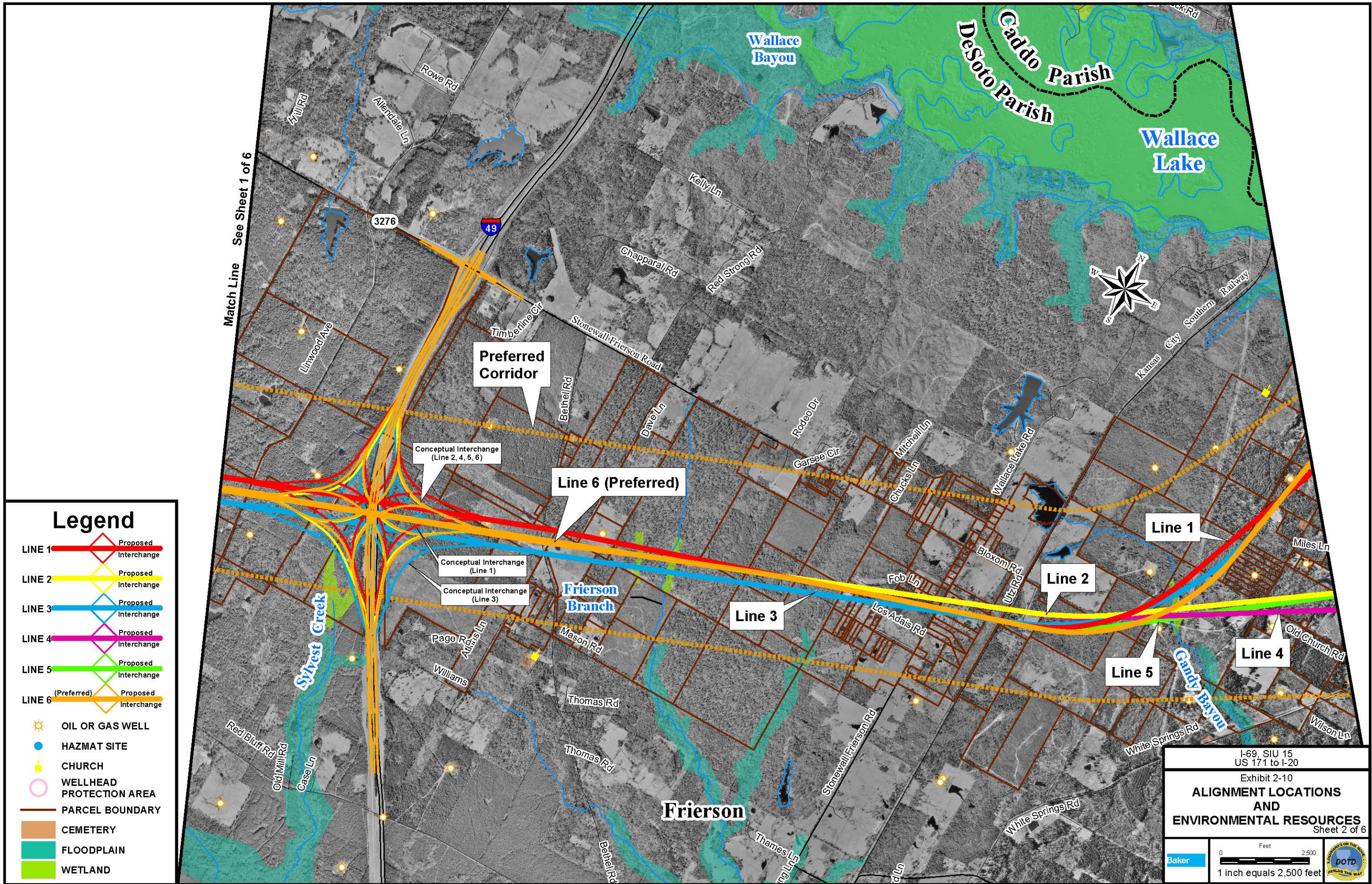
The identification of the Preferred Alignment satisfies, to the fullest extent possible, the

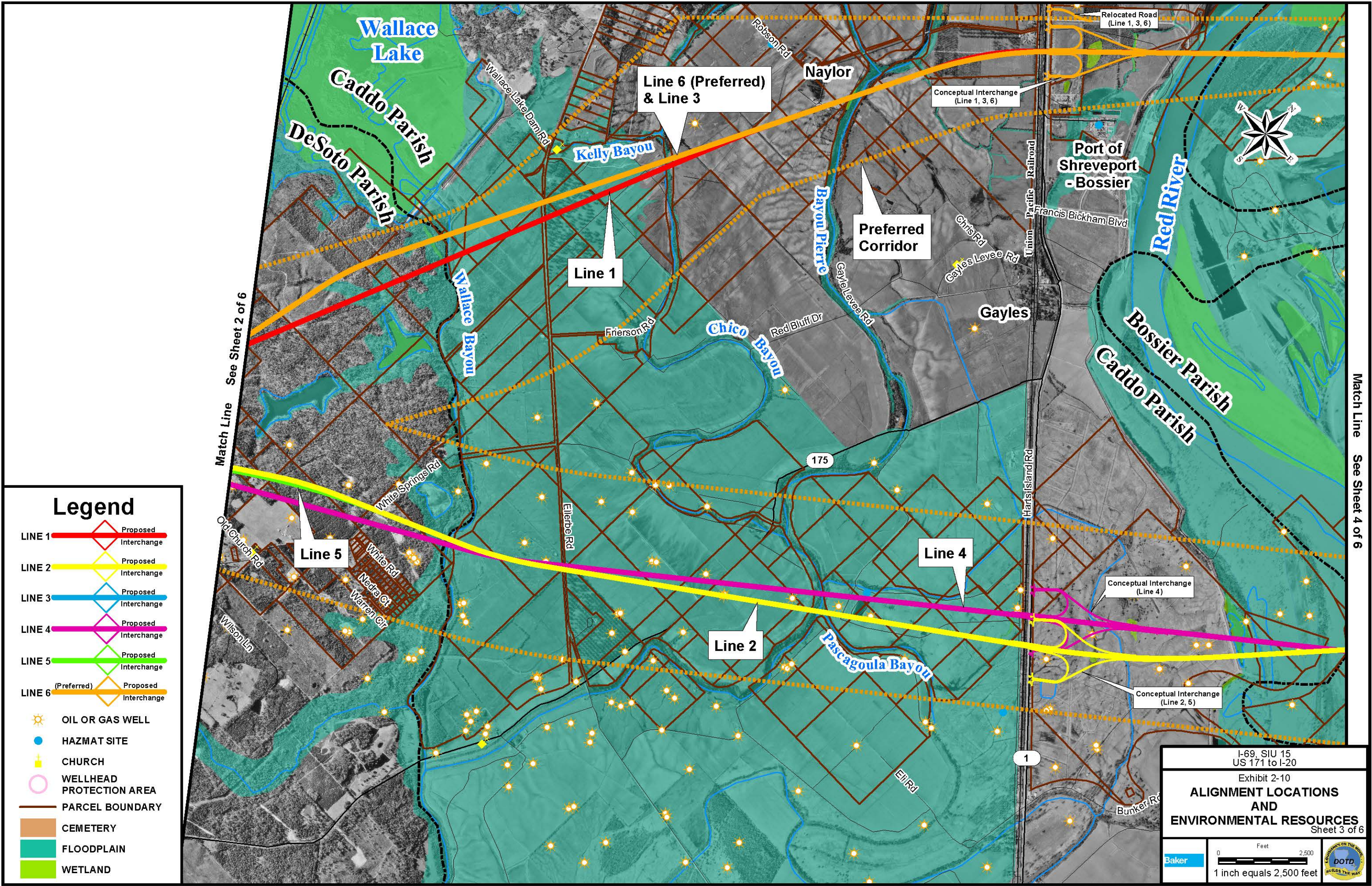
objectives of the merged NEPA/404 process that has been adopted for this study.

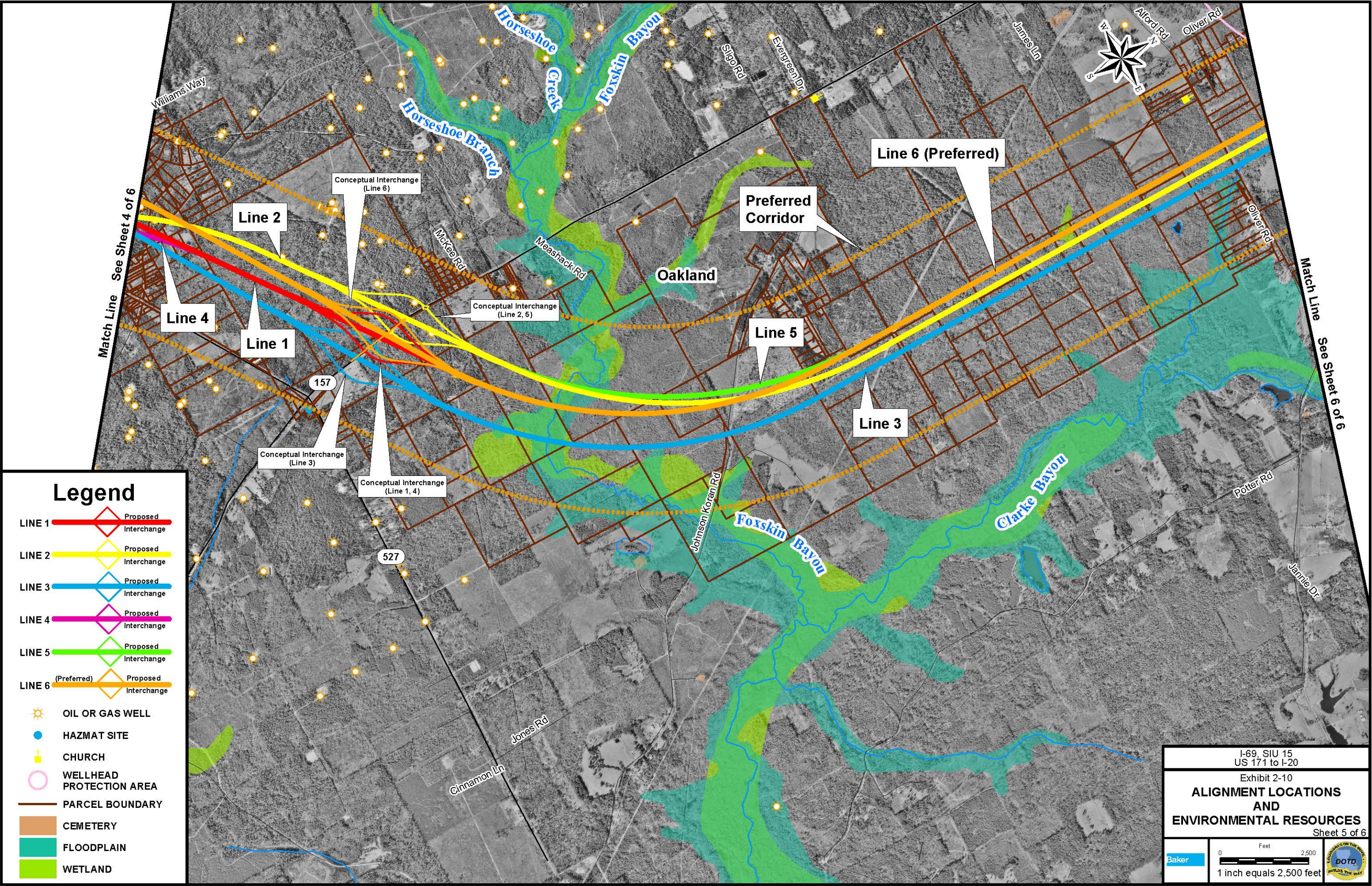
This multi-step project approach allowed a thorough consideration of the alternatives developed during both the corridor and alignment study phases with respect to potential impacts to “waters of the United States”, including wetlands, and functioned as the Alternatives Analysis. Impacts were minimized to the greatest extent practicable in accordance with Section 404 b(1) Guidelines. The Preferred Alignment would have the least wetland impacts.

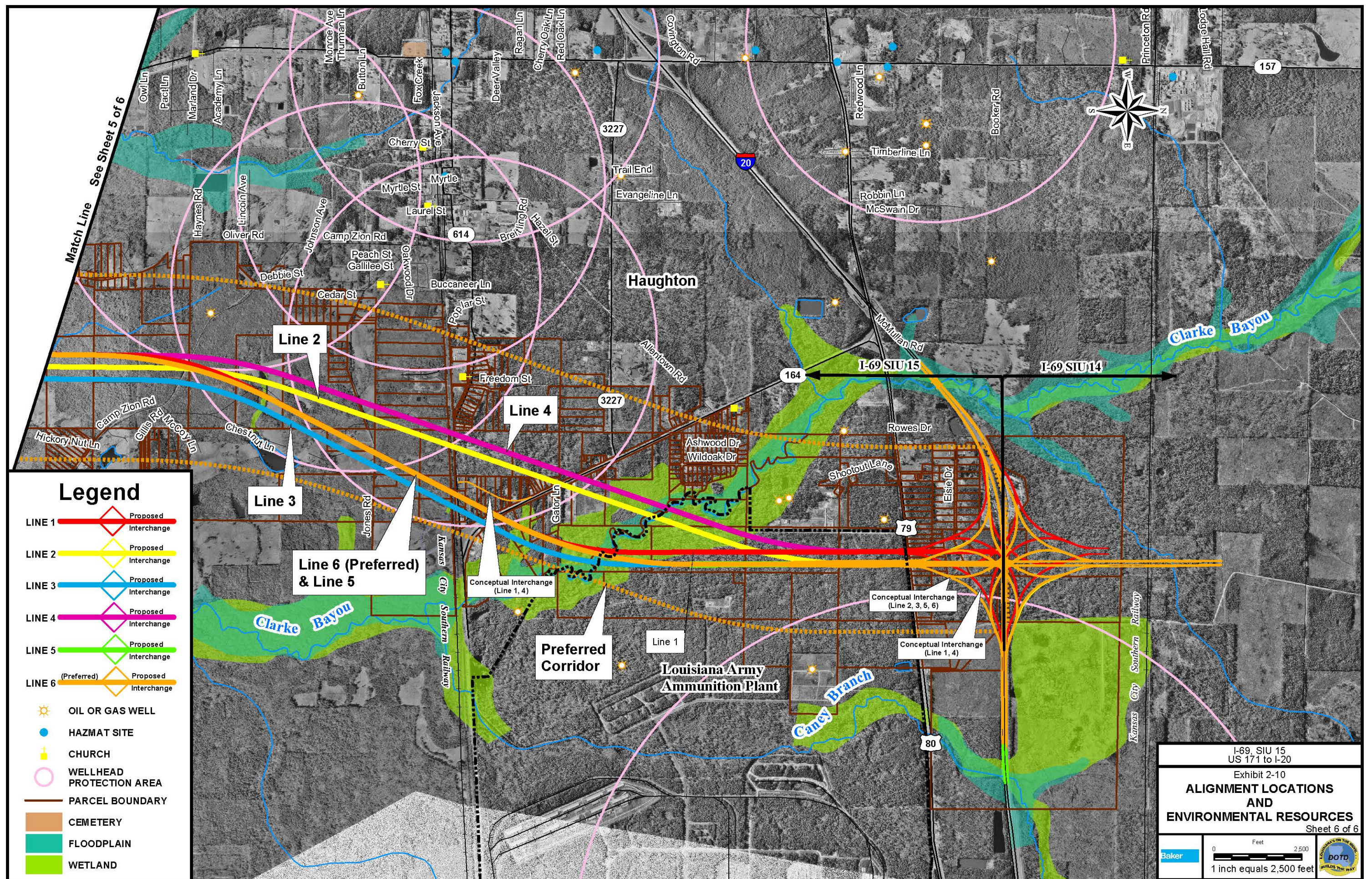
An alignment recommendation was submitted to the Federal cooperating agencies (COE, FWS, USCG, EPA) and the Caddo Nation of Oklahoma. The alignment recommendation detailed the alignment study process, provided the rationale for selecting the Preferred Alignment, and requested written comments.











The COE and the EPA concurred with the Preferred Alignment recommendation. The USCG had no comments at this time. In their response, the FWS indicated that they could not concur with the Preferred Alignment recommendation until biological assessments of the potential effects to Federally listed endangered species were completed. Correspondence is provided in Appendix D, pages D-93 to D-104. The Caddo Nation of Oklahoma did not respond. At a January 25, 2005 meeting, the DOTD, the FHWA, and the FWS agreed that biological assessments for the Interior least tern (*Sterna antillarum*) and Red-cockaded woodpecker (*Picoides borealis*) would be conducted and that the Endangered Species Act (ESA) Section 7 consultations with the FWS would be completed prior to the issuance of the Final Environmental Impact Statement. The biological assessments are discussed in Section 2.5.2.

A meeting was also held with representatives from the USCG and the COE on April 14, 2005 to discuss navigation studies for the Red River bridge crossing. It was agreed that a concept study would be conducted on the Preferred Alignment Red River bridge crossing to determine span lengths and horizontal and vertical navigation clearances and the findings presented in the Final Environmental Impact Statement. Refer to Section 2.5.3 for a summary of the study.

2.5 PUBLIC HEARINGS AND ADDITIONAL STUDIES

2.5.1 Public Hearings

Public Hearings were held in Haughton and Stonewall, Louisiana on July 20 and 21, 2005, respectively. Over 140 Draft EISs were distributed to federal and state agencies, elected officials, Native American tribes, and other organizations and places listed in Section 6 of the Draft EIS. Comments received on the Draft EIS are discussed in Section 7 and were considered in the development of additional alternatives and ultimately the identification of the Selected Alignment.

Additional environmental and engineering studies were conducted in response to comments received from the FWS, USCG, and the DeSoto Parish Police Jury during the Draft EIS review period that closed August 1, 2005. In their June 15, 2007 to US Senator Mary Landrieu, the Louisiana State University Agricultural Center (LSU AgCenter) expressed their opposition to the Draft EIS Preferred Alignment (Line 6) passing through the LSU AgCenter Pecan Research Station (Station) and requested her assistance in reconsidering the preferred alignment decision (see Section 7 and Appendix F, page F-73). Senator Landrieu forwarded the LSU AgCenter's letter to the FHWA for appropriate action.

2.5.2 Biological Assessments and Endangered Species Act Consultation

At a January 25, 2005 meeting, the DOTD, the FHWA, and the FWS agreed that biological assessments for the Interior least tern (ILT) (*Sterna antillarum*) and Red-cockaded woodpecker (RCW) (*Picoides borealis*) would be conducted and that the Endangered Species Act (ESA) Section 7 consultations with the FWS would be completed prior to the issuance of the Final Environmental Impact Statement.

A biological assessment (BA) for the ILT was conducted in August 2005 and FHWA determined that the project “may affect, but is not likely to adversely affect” the species. In their November 14, 2006 letter, the FWS concurred with FHWA’s determination and indicated that no further ESA Section 7 consultation would be required unless there were changes in the scope or location of the project, or construction was not initiated within one year (see Appendix D, page D-132). The ILT BA is discussed in Section 4.12.1. A BA for the RCW was conducted in October and November 2006 and FHWA also determined that the project “may affect, but is not likely to adversely affect” the species. In their May 22, 2007 letter, the FWS again concurred with FHWA’s determination and indicated that no further ESA Section 7 consultation would be required unless there were changes in the scope or location of the project, or construction was not initiated within one year

(see Appendix D, page D-138). The RCW BA is discussed in Section 4.12.2.

In their September 15, 2010 letter (see Appendix D, page D-166), the FWS reaffirmed that the project was not likely to adversely affect threatened and endangered species and no further consultation was necessary unless there were changes in the project’s scope or location. If the project has not been initiated within one year, follow-up consultation should be accomplished prior to construction (see Appendix D, page D-166 for the latest correspondence). The Record of Decision will document FWS concurrence with FHWA’s ILT and RCW determinations, and completion of the ESA Section 7 consultation.

2.5.3 Conceptual Red River Bridge Study

At an April 14, 2005 meeting, the DOTD, FHWA, USCG, and the COE agreed that a concept study would be conducted on the Draft EIS Preferred Alignment Red River Bridge crossing to establish span lengths and horizontal and vertical navigation clearances.

A Conceptual Bridge Study was conducted to provide information relative to navigation and the effects the bridge will have on navigation interests using the waterway. Pier locations, horizontal and vertical clearances, and the alignment of the main channel navigation opening and approach spans were established; and hydrologic/hydraulic and scour analyses performed in coordination with the

USCG, the COE and various waterway associations.

The USCG established both horizontal and vertical requirements for the navigational channel of the Red River at River Mile (RM) 212.2 (see Appendix D, page D-135). The horizontal criteria are as follows:

- ☐ The right (descending) pier must be located on the (west) bank
- ☐ The left (descending) pier must be located 300 feet from the right descending pier toward the left descending bank (normal to the flow of the river at this location)
- ☐ The resulting minimum horizontal clearance for the navigation span shall be 300 feet, measured normal to the flow of the river (Because of the skew of the alignment relative to the flow of the river, the actual main span length must be in the order of 350 feet)

In their February 27, 2012 letter, the USCG revised the vertical clearance criterion (see Appendix D, page D-176) to be as follows:

- ☐ 62 feet above normal pool

The COE Vicksburg District provided the following information (see Appendix D, page D-137) related to water surface elevations at RM 212:

- ☐ Normal Pool: EL 145.0' NGVD

☐ 2% Flowline: EL 148.5' NGVD

☐ 100 Year Flood: EL 155.5' NGVD

☐ Ordinary High Water: *EL 141.0' NGVD

☐ Minimum Navigable Water EL 145.0' NGVD

* The last documented Ordinary High Water Elevation at RM 212 was elevation 141.0' NGVD but has not been updated since the installation of the locks and dams on the Red River system.

Marine Vessel Impact

The Draft EIS Preferred Alignment (Line 6) crossing over the Red River is located at River Mile (RM) 212, approximately 12 river miles upstream of the Joe. D. Waggoner, Jr. Lock & Dam No. 5. Vessels using the Red River vary from small recreational craft to large commercial tows. These tows may consist of towboats up to 1,800 horsepower in size and pushing from one to six barges. These tows usually are arranged 3 barges long and 2 barges wide. The overall tow dimensions are about 685 feet long and 70 feet wide including the tow. Towboats range in height from 35 to 45 feet with an average upbound speed of 5 mph and a downbound speed of 6.5 mph (see Appendix D, page D-135). This information, in conjunction with historic and future trends related to commercial navigation on the Red River formed the basis for barge impact studies to define the overall dimensions of the navigation channel piers and piers located within the 100-year floodplain. It was assumed that physical protection systems such as

fendering, dolphin protection, island protection, etc., would not be employed. During final design, a comprehensive barge impact study will be conducted to ensure that piers within the 100-year floodplain are impact worthy and a detailed navigation study will be coordinated with the USCG. Navigation lighting will be in accordance with 33 CFR 18.

Main Span Unit

In conformance with the navigational requirements set forth by the USCG, the right descending pier would be situated on the west bank of the river. The left descending pier would be established 300-feet normal to the flow of the river and projected onto the I-69 centerline, which is skewed approximately 30 degrees relative to the flow of the river. Assuming the main river piers consist of 25-foot diameter columns below the 100-year flood elevation, this would create a 380-foot main span over the navigable channel (see Exhibit 2-11). Side spans of approximately 230-feet and 270-feet would provide balance to the dead and live loads in the main span, creating a 880-foot main span unit (see Exhibit 2-11). The final main span unit configuration, pier sizes, and construction methods would be established during final design.

Approach Spans

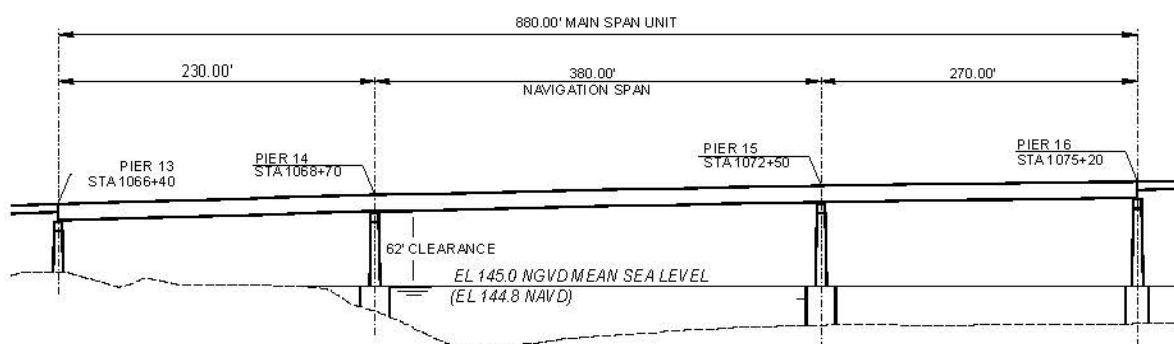
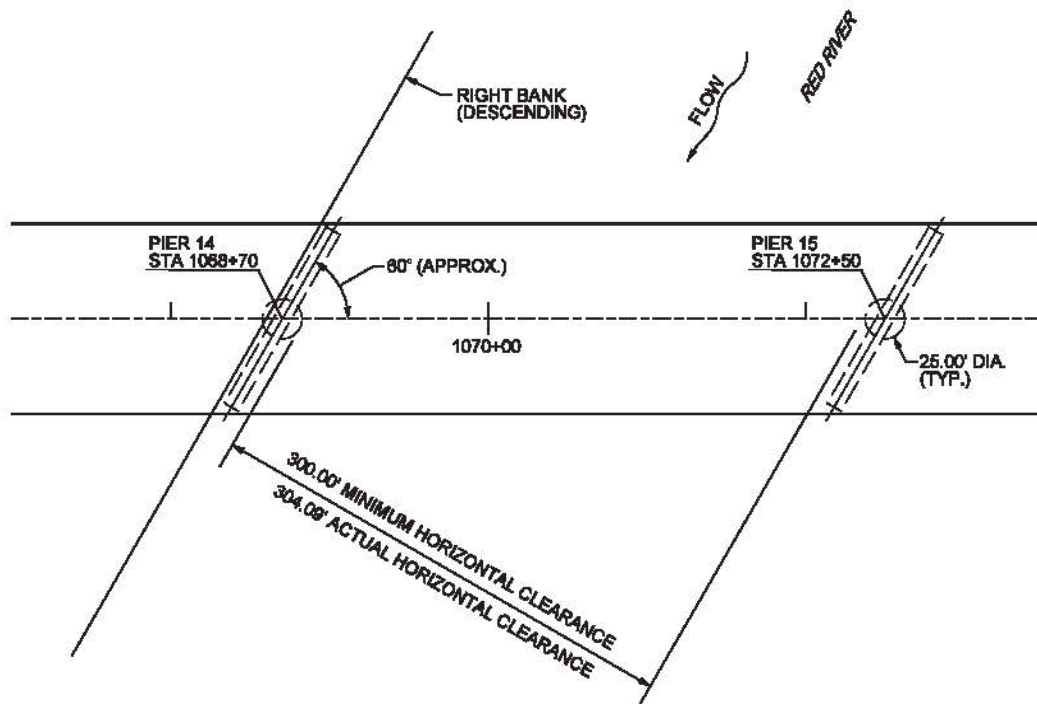
Since the levee failure during Hurricane Katrina in 2005, the COE has become much more restrictive with new construction as it interfaces with levees. The COE no longer permits placement

of piers through existing levees and foundations constructed in and around levees must remain well away from levee's toe of slope. New facilities crossing levee systems must ensure a 15-foot minimum vertical clearance above the top of levees to allow for emergency and maintenance equipment to safely pass below proposed structures. Levee armoring with riprap or revetment mats may be required in the shadowline of the proposed structure to mitigate erosion and loss of vegetation. The final approach spans configuration, pier sizes, and construction methods would be established during final design.

Hydrologic/Hydraulics and Scour

A preliminary hydrologic and hydraulic study was conducted to determine the impacts to the 100 year water surface elevation, effects to backwater, and scour effects resulting from preliminary main and approach span spacing, and pier sizes.

Existing and proposed conditions were modeled using the COE HEC-RAS version 3.1.3 software, COE HEC Geo-RAS 4.1 for ArcGIS 9.0, and hydrologic data from the COE *Red River Waterway Design Memorandum No. 3 Revised, Supplement No. 2, February 1991*. The 1-percent chance flood event discharge at RM 212 is 205,000 cubic feet per second (cfs). The COE hydraulic data was supplemented with bathymetric and topographic data. Aerial photography was used to assist in determining Manning's roughness coefficient (n) values.



I-69
US 171 to I-20

Exhibit 2-11
**MAIN SPAN
OVER THE NAVIGATION
CHANNEL**

Baker

NOT TO SCALE



The existing conditions model was then calibrated using the discharge rates from the COE *Memorandum No. 3 Revised* to replicate the regulated profile published in the COE *Memorandum No. 3 Revised*.

For the 1-percent chance flood event, the surface water elevation would increase of 0.03 feet (0.36 inches) immediately upstream of the proposed bridge. The 0.03' rise is relatively minor and further analysis to determine the upstream limit was not warranted.

The scour analyzed followed the procedures outlined in *Hydraulic Engineering Circular No. 18, Evaluating Scour at Bridges, Fourth Edition*, (HEC-18) published by the U.S. Department of Transportation, Federal Highway Administration. Routines within HEC-RAS were used to perform the scour analyses and the scour depth for the main span and approach span piers were 24 feet and 26 feet, respectively. The results were compared against the procedures outlined in HEC-18. Both analyses produced comparable results.

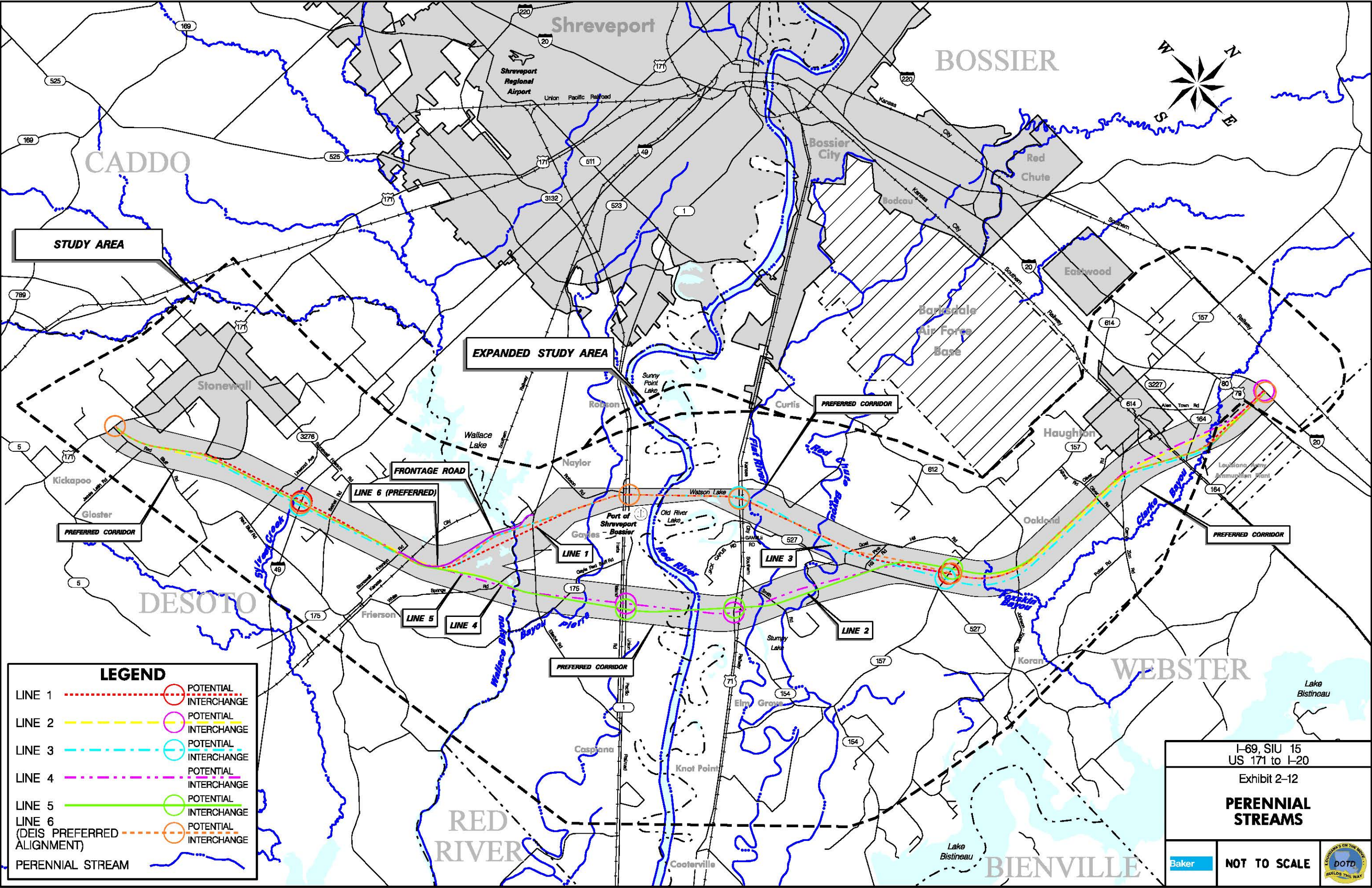
The COE may require detailed hydrologic/hydraulic studies of the floodway at various flood stages to represent existing and final conditions, as well as construction phasing. This may include modeling construction equipment in the floodway, temporary shore towers or bents used to erect bridge spans,

etc. Additional studies deemed necessary would be conducted during final design.

The USCG reviewed the study in coordination with the COE and various waterway associations, and found the study acceptable and determined that no further reviews were necessary at this time (see Appendix D, page D-177). Detailed navigation studies and collision design alternatives, and the Bridge Permit application, will be coordinated with the USCG during final design.

2.5.4 Navigable Waters Evaluation

A Navigable Waterways evaluation was conducted to evaluate waterways crossed by the alignments include perennial and intermittent streams or bayous, and man-made ponds primarily associated with agricultural activities. All alignments cross the Red River, which is used for commercial navigation from its confluence with the Mississippi River to Shreveport, Louisiana, north of the Study Area. Perennial streams crossed by the alignments include Wallace Bayou, Chico Bayou, Bayou Pierre, Flat River, Red Chute Bayou, Foxskin Bayou, and Clarke Bayou (see Exhibit 2-12). None of the watercourses crossed by the alignments, other than the Red River, meet the USCG criteria for a navigable waterway.



In accordance with 23 USC 144(h), (23 CFR Section 650.805), the FHWA determined USCG bridge permits are only required for portions of the project spanning the Red River. In their October 4, 2011 letter, FHWA stated that a USCG permit will be required for the Red River at RM 212.2 since this waterway is used and is susceptible to use in its natural condition or by reasonable improvements as a means to transport interstate or foreign commerce and is non-tidal, or if tidal is used only by recreational boating, fishing and other small vessels less than 21 feet in length. FHWA also determined that USCG permits are not required for the other above-named waterway crossings. In their October 27, 2011 letter, the USCG concurred with FHWA's determination (see Appendix D, page D-174).

2.5.5 Revised Traffic Analysis

The regional travel demand model maintained by the Northwest Louisiana Council of Governments (Shreveport-Bossier City area Metropolitan Planning Organization (MPO)) was expanded to include the entire Study Area. The Draft EIS traffic analysis was revised using the expanded regional travel demand model to evaluate and verify the serviceability of the highway system and the I-69 conceptual interchanges. Traffic volumes were obtained from the model for the I-69 Project as part of the entire National I-69 Corridor (Full Build) as well as for a stand-alone section of independent utility (Partial Build).

Capacity analysis is a tool used to measure the quality of service provided by a roadway. This analysis was performed using Highway Capacity Software version 6.1. The software follows the procedures of the *Highway Capacity Manual 2010 (HCM 2010)* published by the Transportation Research Board.

The revised capacity analysis was conducted to determine the existing year 2000, opening year 2015 and design year 2030 Level of Service (LOS) for the No-Build and Build conditions. Year 2000 has been used as the existing year for consistency because the Draft EIS utilized 1999 as the existing year. As described in Section 2.4.4, LOS is a quality measure describing operational conditions within a traffic stream. Six LOS are defined, with letters designating each level, from A to F. LOS A represents the best operating conditions and LOS F the worst. Typically LOS C or better is considered acceptable in rural areas (e.g. I-69, US 171, I-49, LA 1, and I-20) and LOS D is considered acceptable in urban areas (e.g. LA 1 near I-220, I-220, and I-20 near I-220).

Table 2-12 presents the capacity analysis results for the Existing, No-Build, Partial Build and Full Build conditions.

Table 2-12
REVISED NO-BUILD AND BUILD ALTERNATIVES LEVEL OF SERVICE

MAINLINE SEGMENTS															
Roadway		2000 Existing		2015 No-Build		2015 Partial Build		2015 Full Build		2030 No-Build		2030 Partial Build		2030 Full Build	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
I-69	West of US 171	--	--	--	--	--	--	A / A	A / A	--	--	--	--	A / A	A / A
I-69	Between US 171 and I-49	--	--	--	--	A / A	A / A	A / A	A / A	--	--	A / A	A / A	A / A	A / A
I-69	Between I-49 and LA 1	--	--	--	--	A / A	A / A	A / A	A / A	--	--	A / A	A / A	A / A	A / A
I-69	Between LA 1 and LA 71	--	--	--	--	A / A	A / A	A / A	A / A	--	--	A / A	A / A	A / A	A / A
I-69	Between LA 71 and LA 157	--	--	--	--	A / A	A / A	A / A	A / A	--	--	A / A	A / A	A / A	A / A
I-69	Between LA 157 and I-20	--	--	--	--	A / A	A / A	A / A	A / A	--	--	A / A	A / A	A / A	A / A
I-69	North of I-20	--	--	--	--	--	--	A / A	A / A	--	--	--	--	A / A	A / A
US 171	North of I-69	A / A	A / A	A / A	A / A	A / A	A / A	A / A	A / A	A / A	A / A	A / A	A / A	A / A	A / A
	South of I-69					A / A	A / A	A / A	A / A			A / A	A / A	A / A	A / A
I-49	North of I-69	A / A	A / A	B / A	A / A	B / A	A / A	C / B	B / B	B / A	A / B	B / B	B / B	C / B	B / B
	South of I-69					B / A	A / A	B / A	A / A			B / A	A / A	B / A	A / A
LA 1	North of I-220	C / C	D ¹ / C	C / B	B / B	C / B	B / B	C / B	B / B	C / B	B / B	C / B	B / B	C / B	B / B
	North of I-69	A / A	A / A	A / A	A / A	A / A	A / A	A / A	A / A	A / A	A / A	A / A	A / A	A / A	A / A
	South of I-69					A / A	A / A	A / A	A / A			A / A	A / A	A / A	A / A
US 71	North of I-69	C / C	C / C	D ² / C	C / C	D ² / D ²	C / D ²	D ² / D ²	D ² / D ²	A / A	A / A	A / A	A / A	A / A	A / A
	South of I-69					C / C	C / C	D ² / C	C / C			A / A	A / A	A / A	A / A
LA 157	North of I-69	C / C	C / C	C / C	C / C	C / C	C / C	C / C	C / B	C / C	C / C	C / C	C / C	C / C	C / C
	South of I-69					C / C	C / C	C / C	C / C			C / C	C / C	C / C	C / C
I-20	West of I-220	C / B	C / C	B / B	B / B	B / B	B / B	B / B	B / B	B / B	B / B	B / B	B / B	B / B	B / B
	West of I-69	A / A	A / A	A / A	B / A	A / A	B / A	B / B	B / B	B / B	B / B	B / B	B / B	B / B	B / B
	East of I-69					B / A	B / B	B / A	B / B			B / B	B / B	B / B	B / B
I-220	West of LA 1	A / A	A / A	A / A	A / A	A / A	A / A	A / A	A / A	A / A	B / A	A / A	B / A	A / A	B / A
	East of LA 1	A / A	A / A	A / A	A / A	A / A	A / A	A / A	A / A	B / B	B / B	B / B	B / B	B / B	B / B

Source: Michael Baker Jr., Inc., 2011

Notes: X / X = Northbound / Southbound OR Eastbound / Westbound

¹ LOS D mitigated by volume diversion not associated with I-69 project.² LOS D mitigated by widening project contained in the Long Range Transportation Improvement Projects Program.

The analysis indicates that the I-69 mainline is projected to operate at LOS A under both the 2015 and 2030 Build scenarios. US 171, I-49, LA 157, I-20, and I-220 are projected to operate at acceptable levels of service during each of the scenarios. LA 1 currently experiences LOS D. However this poor level of service is anticipated to be mitigated by the projected decrease in volume resulting from other projects in the Shreveport area. US 71 north of the I-69 Interchange is projected to experience LOS D under the design year 2015 No-Build and Build conditions.

Acceptable levels of service are projected on this section of US 71 under the Year 2030 conditions due to the planned widening of US 71 from two (2) to four (4) lanes. Widening US 71 to four lanes under the 2015 Build condition would mitigate the projected poor level of service.

2.5.6 Alignment Shift at US 71

In response to over 100 comments received on the Draft EIS, a minor southeastern shift to Line 6 (DEIS Preferred Alignment) and the interchange with US 71 was made to avoid direct impacts to the Elm Grove Baptist Church. The alignment shift provides approximately 585-feet control of access (COA) to the existing church driveway. The minor shift does not impact any additional parcels or property owners.

2.5.7 Frontage Road Addition

In its July 27, 2005 Resolution, the DeSoto Parish Police Jury (DPPJ) requested that a frontage/access road be constructed between Bloxom Road and Ellerbe Road (in Caddo Parish), in lieu of a grade separating either I-69 or Old Church Road, to maintain access to properties and residents along Old Church Road bisected by the Draft EIS Preferred Alignment (Line 6) and to other properties bounded by Kansas City Southern Railway (KCSR) to the west, Wallace Lake to the north, Wallace Bayou to the east, and the Draft EIS Preferred Alignment (Line 6) to the south. DPPJ noted that the frontage/access road would create a more regional benefit by providing a connector between portions of DeSoto and Caddo Parishes north of I-69.

A Frontage Road was added between Ellerbe Road in Caddo parish and Stonewall Frierson Road in DeSoto parish. The Frontage Road is adjacent to and parallels the Draft EIS Preferred Alignment (Line 6).

The Frontage Road would be a two-lane, undivided, uncontrolled access facility on new location designed to DOTD Rural Collector Roads and Streets (RC-2) Standards. The roadway would have one 11-foot lane in either direction with 8-foot outside shoulders and would include a new at-grade crossing with the KCSR rail line. A 150-foot corridor was used to evaluate potential impacts.

The final Frontage Road location within the 150-foot corridor will be established during final design.

The Frontage Road potential impacts and estimated construction costs are presented in Section 4 and summarized separately in Table S-1.

Louisiana State legislation limits the amount of roadway that can be included in the State highway system. Therefore, after construction, the Frontage Road operational and maintenance responsibilities will be turned over to the local municipalities, most likely DeSoto and Caddo Parishes, so the amount of roadway included in the State highway system remains unchanged. Parish-City/State Agreements will be required to transfer maintenance responsibilities to the municipalities.

2.5.8 Ellerbe Road Interchange

In its July 27, 2005 Resolution, the DPPJ also requested that an interchange be constructed at the crossing of the Draft EIS Preferred Alignment (Line 6) with Ellerbe Road in order to maximize the availability, utilization and efficiency of I-69 for freight and people destined in to and out of the northeast portion of DeSoto Parish.

An interchange at Ellerbe Road cannot be provided because it would conflict with the long-term transportation plan for the region. The Shreveport-Bossier Metropolitan Area Transportation Plan Update 2001-2025 identified the Inner Loop Extension (LA 3132) from Floumoy-Lucas to I-69 as a long-range improvement to the regional

transportation system. The Transportation Plan Update indicates that the Inner Loop Extension would be a 4-lane highway connecting to I-69 via an interchange located between Ellerbe Road and LA 1. DOTD is currently evaluating the feasibility of extending the Inner Loop to I-69. The feasibility study is expected to be completed in late-2011 and the NEPA process initiated in early-2012. If an interchange with Ellerbe Road were added there would be insufficient room to add the Inner Loop Extension interchange while satisfying highway design standards.

If determined necessary by the NLCOG for the regional transportation needs, indirect access from Ellerbe Road to I-69 might be accomplished via a future connection to the Inner Loop Extension.

2.5.9 LSU Pecan Research Station Studies

In response to the LSU AgCenter's comments, shifts to the Draft EIS Preferred Alignment (Line 6) and reconfiguration of the LA 1 interchange to avoid Station impacts were considered. Several meetings were held with LSU AgCenter representatives, and a March 25, 2010 meeting was also held with the MPO's Transportation Policy Committee. Alternatives to avoid the Station following an alignment along the Preferred Corridor's northern route through the Port of Shreveport-Bossier were not feasible. An alignment that avoided the facility while satisfying both driver expectations and AASHTO and DOTD design criteria could not be developed due to the

proximity of the Station within the Preferred Corridor; the Port and their current and planned infrastructure improvements; the CCS Midstream and ChemTrade Logistics properties, both identified hazardous waste sites; and an existing SWEPCO electric substation.

Two additional alignments were developed for stakeholder review, one minimizing Station impacts and the other within the Preferred Corridor's southern route to avoid Station impacts.

Line 6R was developed as the minimization alternative (see Exhibit 2-13). LSU AgCenter representatives indicated that it generally took a minimum of four to ten years for the average pecan tree to become viable for meaningful research. A minimization alternative was considered feasible because the LSU AgCenter's timeline could be satisfied by mitigating the Station's research impacts early during final design and sequencing construction activities to not impact the Station until trees were viable. Line 6R shifts the Draft EIS Preferred Alignment (Line 6) and LA 1 interchange eastward and utilizes a retaining wall along the alignment's west side to minimize Station impacts. Line 6R included both the US 71 interchange shift to avoid the Elm Grove Baptist Church and the frontage road requested by DPPJ.

The avoidance alternative followed an alignment along the Preferred Corridor's southern route. In order to evaluate environmental impacts along the

Preferred Corridor's northern and southern routes, the Draft EIS alignments were divided into three sections; Section 1 from US 171 (southern terminus) to the KCS Railway near Frierson; Section 2 from the KCS Railway near Frierson to LA 157; and Section 3 from LA 157 to I-20 (northern terminus). The Station is in Section 2. Within Section 2, of Lines 2, 4, and 5, Line 2 had the least impact in the majority of the environmental categories evaluated. Line 6-2-6 was developed by combining Line 6 (Draft EIS Preferred Alignment) in Section 1, Line 2 in Section 2, and Line 6 (Draft EIS Preferred Alignment) in Section 3 (see Exhibit 2-13).

Updated Environmental Inventory

The digital orthophotography originally developed for the Project was based on 1998 and 1999 NAPP aerial photography and the environmental inventory of the entire Preferred Corridor was last updated more than five years ago. In advance of the stakeholder outreach meetings to present Line 6R, Line 6-2-6 and Line 6 (Draft EIS Preferred Alignment), the map base and environmental inventory were updated to better represent the project's current natural and social contexts.

The environmental inventories of the entire Preferred Corridor were developed more than 5 years ago, with some localized areas updated for supplemental engineering and environmental studies. Select environmental coverages were updated and included:

- ❑ Project Mapping – Obtained NLCOG 2009 digital orthophotography
- ❑ Standing Structures – Photo-interpreted NLCOG 2009 digital orthophotography to update primary standing structures including residences, businesses, churches, schools, and other public facilities
- ❑ Floodplains – Acquired FEMA DFIRM data in 2010 to determine the extent of the 100-year floodplains and floodways (Bossier, Caddo and DeSoto Parishes datasets, 2008, 2004, and 2003 respectively)
- ❑ Soils - Obtained Bossier, Caddo and DeSoto soils data from NRCS Soil Data Mart to determine the extent of farmland soils
- ❑ Oil & Gas Wells – Obtained digital oil and gas well information from the Louisiana Department of Natural Resources SONRIS database
- ❑ Water Wells – Obtained water well information from the DOTD Well Registry database
- ❑ Property – Obtained Bossier and Caddo parish parcel boundary and ownership information from the NLCOG.

2.6 DRAFT EIS PREFERRED ALIGNMENT REVISIONS

Meetings were held with local officials, resource agencies, and the public to present and obtain input on Line 6R, Line 6-2-6, and Line 6 (Draft EIS Preferred Alignment). The alignments are shown in Exhibit 2-13 and the comparative analysis in Table 2-13.

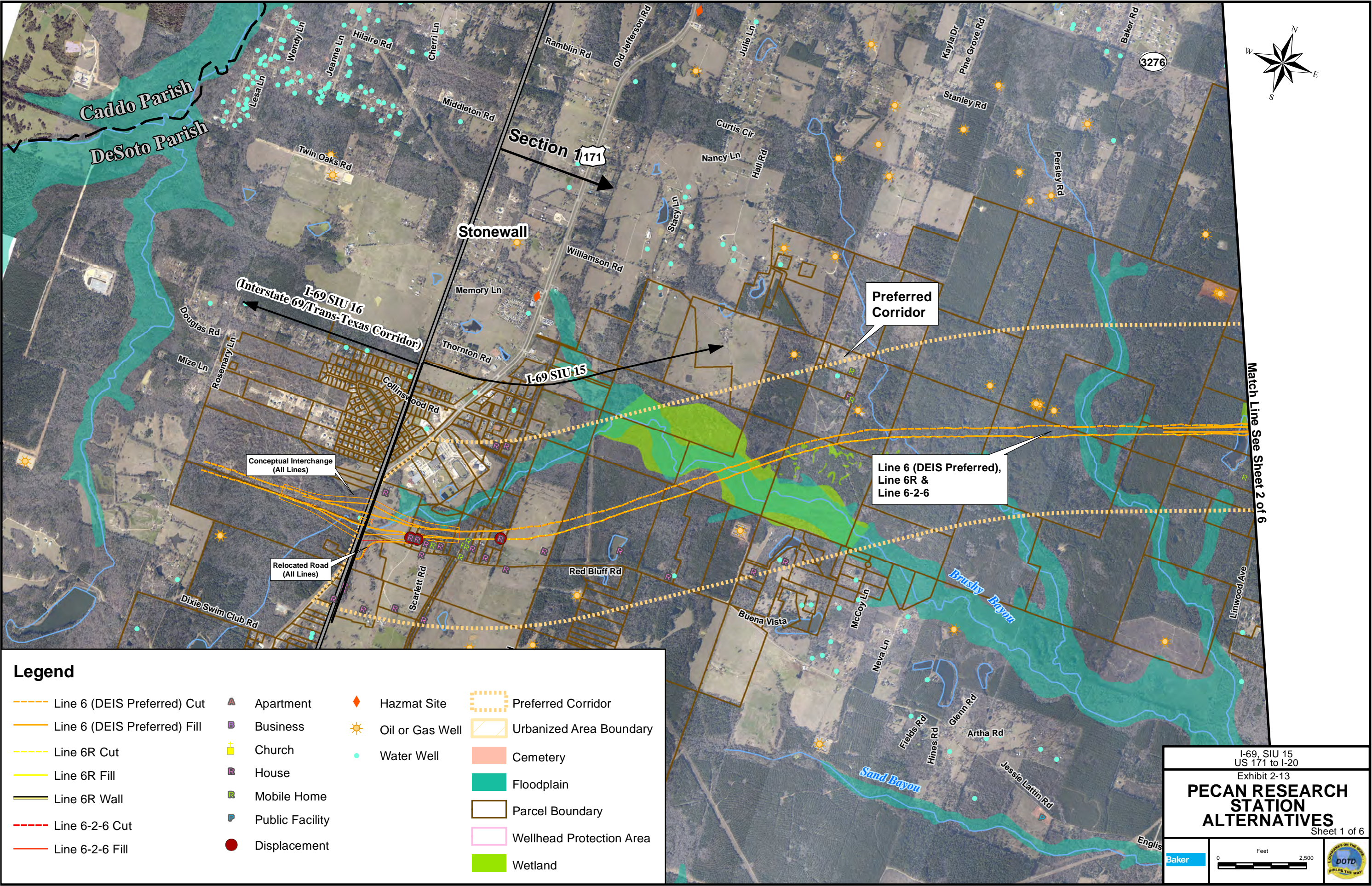
2.6.1 Local Officials Involvement

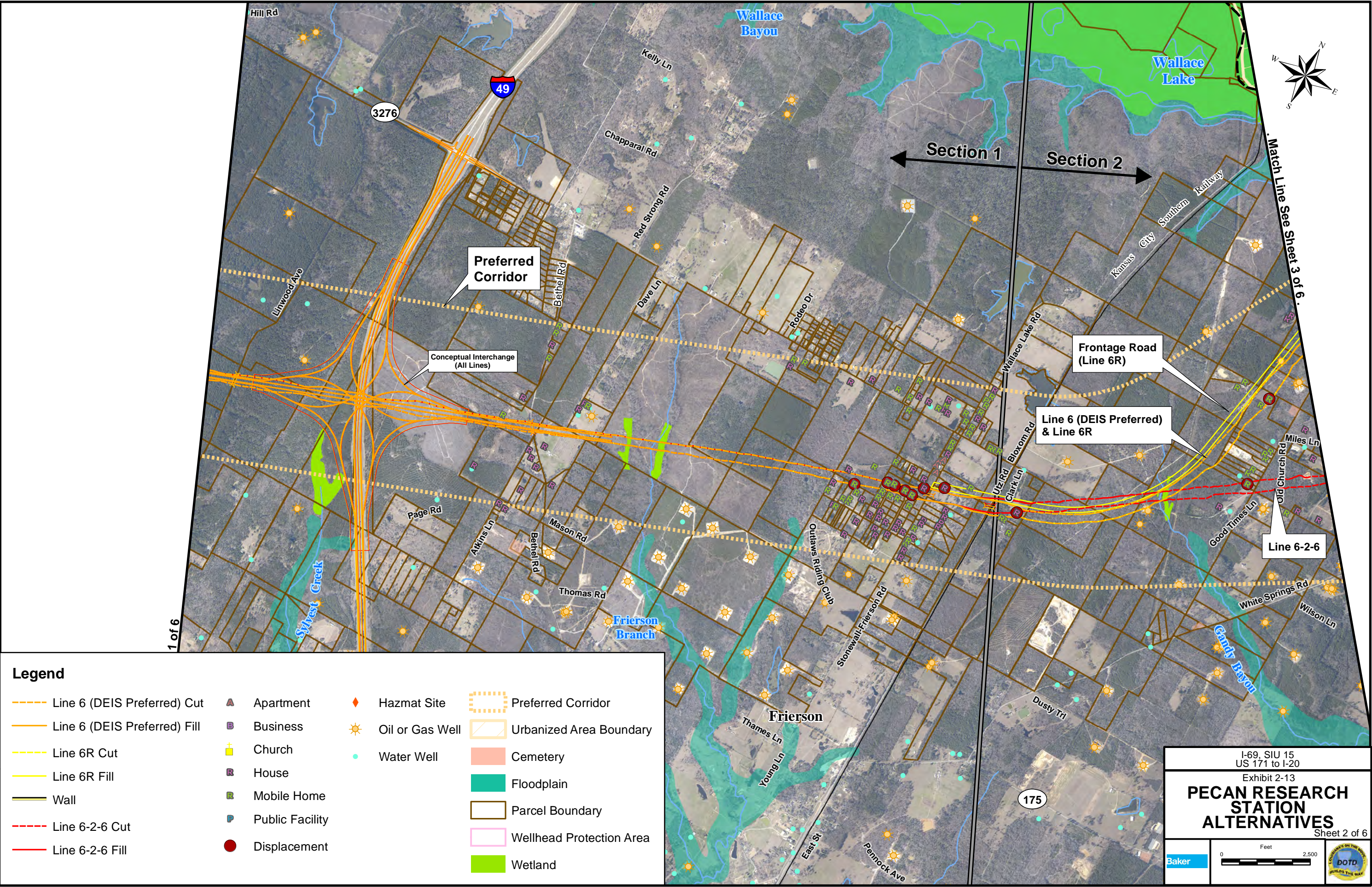
Local officials were invited to participate in an August 2, 2010 local officials meeting to review the updated environmental inventory and the alignments developed. The local officials expressed continued support for an alignment passing through the Port. They expressed their concerns with Line 6-2-6 including the distance from the Port, impacts to the Lucas Sludge Disposal facility, and increased regional transportation improvement costs to widen LA 1 and US 71 and extend the future Inner Loop Extension to connect with the alignment.

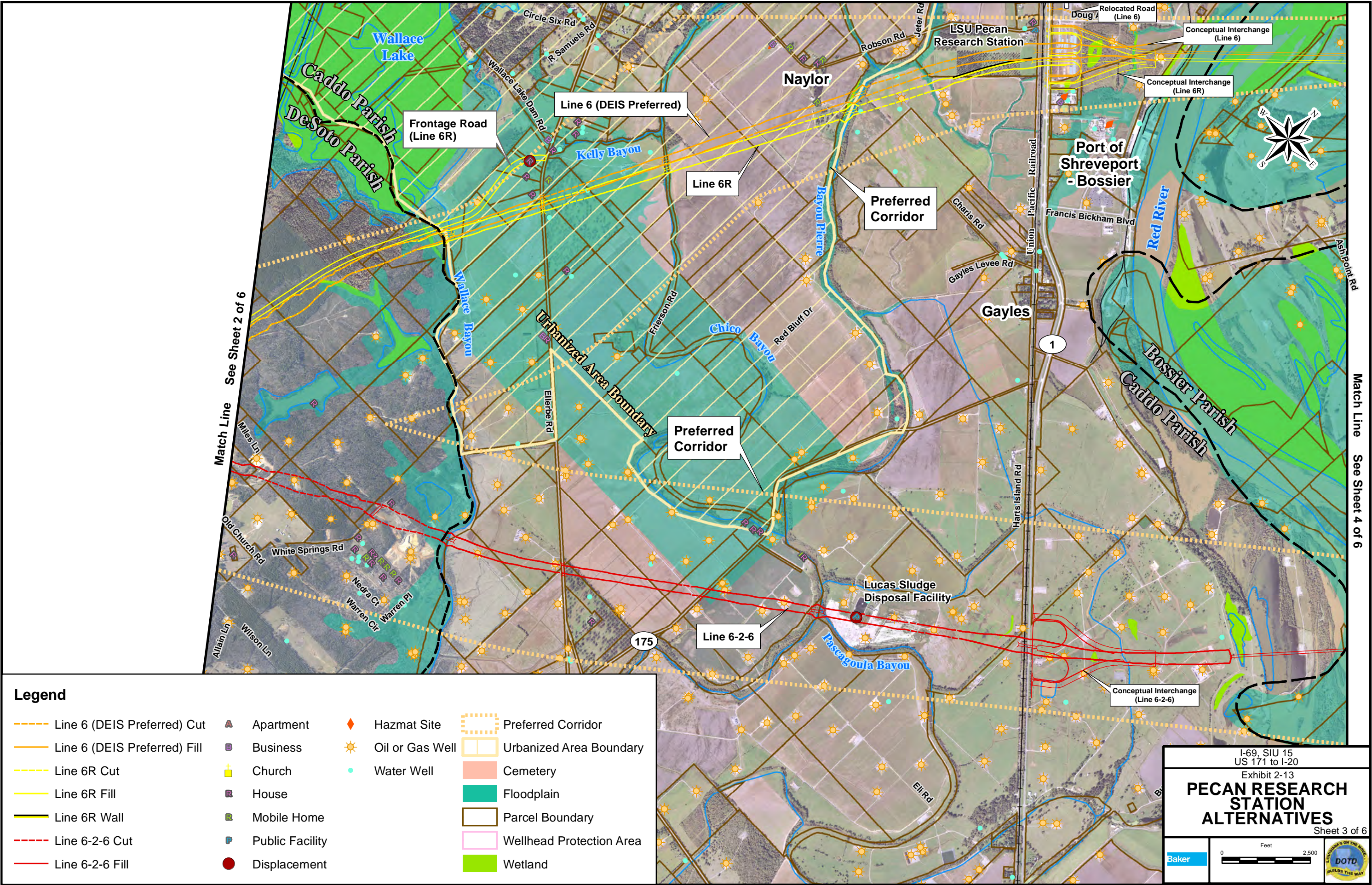
2.6.2 Agency Involvement

Federal and state agencies were invited to participate in an August 3, 2010 agency coordination meeting to review the updated environmental inventory and the alignments developed. No Federal or state agencies attended the meeting, but some agencies provided written comments.

In their August 30, 2010 e-mail, the LADEQ indicated that Bossier, Caddo, and Desoto Parishes were currently in attainment with the National Ambient Air Quality Standards (see Appendix D, page D-160).







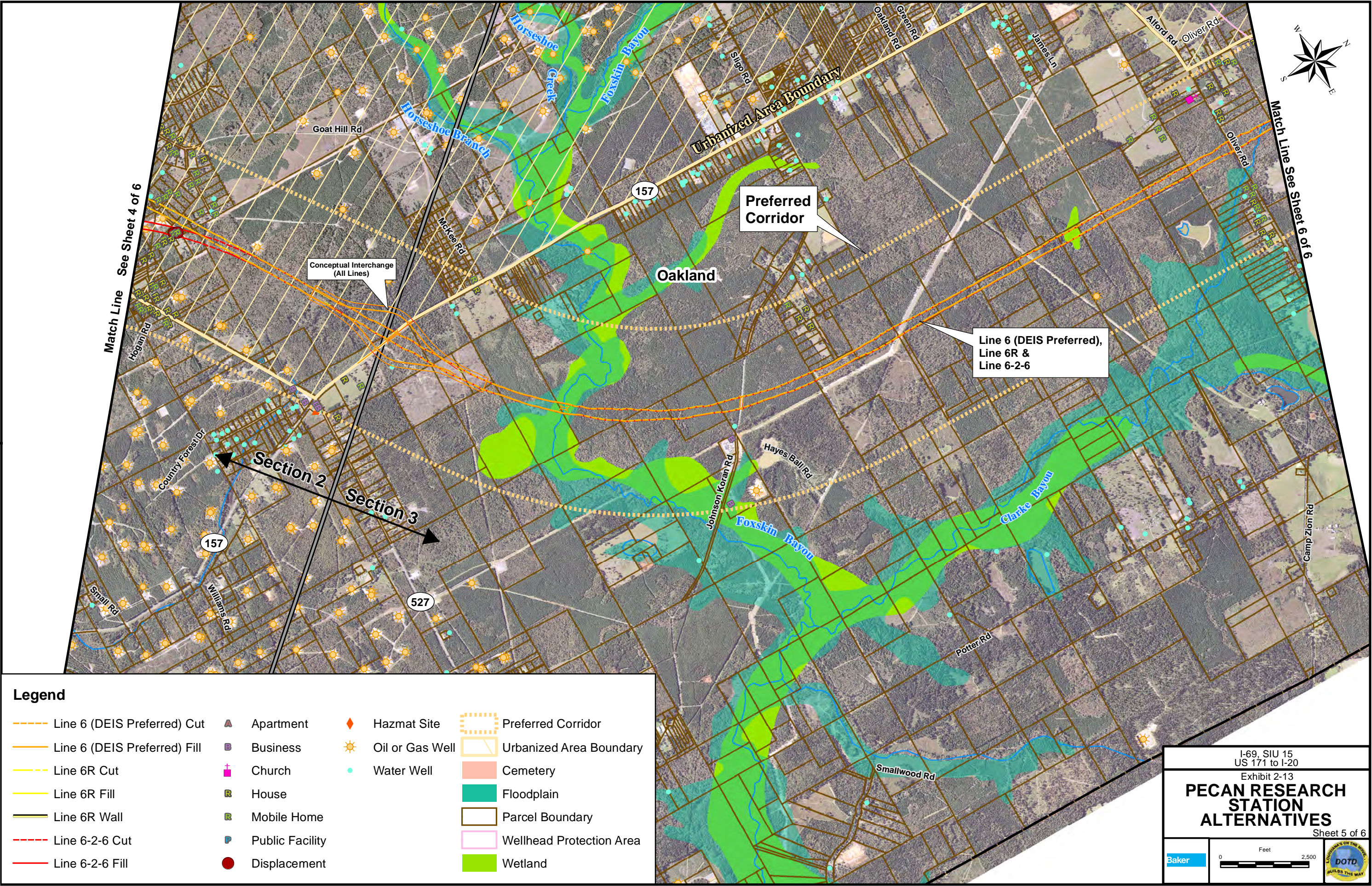


Table 2-13

LSU Pecan Research Station Alternatives Impacts Summary

Section	Alignment	Length	Construction Costs 2010 Base Year (in 000s)	ROW & Utility Costs 2010 Base Year (in 000s)	Structures						Cemeteries	Natural Resources				Cultural Resources			Prehistoric Archaeology Probability Areas			Wellhead Protection Areas	Known Haz Mat Sites	Water Wells	Producing Oil and Gas Wells		
					Houses	Mobile Homes	Apartment Buildings	Businesses	Churches	Public Facilities		Wetlands		Known T&E Species Locations	100-Year Floodplains	NRHP Listed Sites	Recorded Potentially Eligible Sites	Recorded Ineligible Sites	High	Medium	Low						
																			ac	ac	ac						
																			#	#	#				RRAV	RRAV	RRAV
		#	ac	#							ac	Caddoan	Caddoan	Caddoan	Upland	Upland	Upland	Oil Gas									
1	Line 6 (DEIS Preferred)	9.1	\$220,422	\$11,813	4	5	-	-	-	-	-	11	10.5	-	-	-	-	-	-	-	18.5	569.3	-	-	-	-	
	Line 6R																										
	Line 6-2-6																										
2	Line 6 (DEIS Preferred)	15.9	\$440,270	\$18,945	11	3	-	-	1	-	-	11	11.0	-	167.9	-	-	-	25.3 16.4	231.5 12.5	122.0 231.3	-	-	3	- 9		
	Line 6R	15.9	\$442,499	\$19,771	13	2	-	-	-	-	-	12	12.3	-	206.9	-	-	-	27.8 20.8	221.0 13.3	141.3 287.2	-	-	2	- 12		
	Line 6-2-6	15.5	\$415,911*	\$21,188**	2	3	-	-	-	1	-	9	13.6	-	261.1	-	-	-	27.1 14.3	188.1 19.3	157.2 215.1	-	-	-	- 16		
3	Line 6 (DEIS Preferred)	10.6	\$189,917	\$11,276	2	4	-	-	-	-	-	4	22.3	-	11.3	-	1	-	-	-	-	-	-	4	-	1	-
	Line 6R																										
	Line 6-2-6																										
TOTALS	Line 6 (DEIS Preferred)	35.6	\$850,609	\$42,034	17	12	-	-	1	-	-	26	43.8	-	194.4	-	1	-	25.3 27.8	231.5 47.3	122.0 1209.3	4	-	4	- 9		
	Line 6R	35.6	\$852,838	\$42,860	19	11	-	-	-	-	-	27	45.1	-	233.4	-	1	-	27.8 32.2	221.0 48.1	141.3 1265.2	4	-	3	- 12		
	Line 6-2-6	35.2	\$826,250*	\$44,277**	8	12	-	-	-	1	-	24	46.4	-	287.6	-	1	-	27.1 25.7	188.1 54.1	157.2 1193.1	4	-	1	- 16		

Source: Michael Baker Jr., Inc., 2010

* 4-Laning LA 1 and US 71 and extending the planned LA 3132 (Inner Loop) to connect with Line 6-2-6 will add an additional \$68,000,000 to the Region's transportation improvement costs

** includes \$1,000,000 relocation costs for Lucas Sludge Disposal Facility

FEMA indicated in their September 2, 2010 letter several areas of the project were located in a high-risk flood zone and the project must be coordinated with the appropriate Parish floodplain administrators to ensure Flood Damage Prevention Ordinance compliance. In their September 3, 2010 letter, the Natural Resources Conservation Service (NRCS) indicated that the proposed and alternate routes would not directly impact Wetland Reserve Program easements (see Appendix D, page D-163). In their September 15, 2010 letter, the FWS again indicated that the project was not likely to adversely affect threatened and endangered species and no further consultation was necessary unless there were changes in the project's scope or location (see Appendix D, page D-166).

2.6.3 Native American Tribe Involvement

Representatives from the Caddo Nation of Oklahoma, the Mississippi Band of Choctaw Indians, and the Quapaw Tribe of Oklahoma were invited to participate in the August 3, 2010 agency coordination meeting to discuss the alignments and to identify any issues or areas of traditional religious and cultural importance that should be considered during the alignment phase of study. No correspondence was received from any tribe identifying specific concerns.

2.6.4 Public Involvement

Over 250 people attended public meetings held August 2 and August 3, 2010. Nearly 100 written

comment forms were received, with almost 60 supporting the research efforts at the Station and Line 6-2-6. Other public concerns included the area's rapid development before the highway would be constructed; and proximity to and potential loss of personal property.

2.6.5 LSU Coordination

An August 11, 2010 meeting was held with LSU and LA Department of Agriculture and Forestry representatives to further discuss the I-69 Project and the Station impacts. LSU indicated that they were amenable to discussing mitigation options to offset the Station impacts (see Appendix F, page F-116).

A November 10, 2010 meeting was held with LSU, NLCOG, and Port of Shreveport–Bossier representatives to discuss mitigation measures to offset potential Station impacts ranging from acquisition of adjacent lands and necessary improvements to relocating the entire Station. LSU agreed to prepare a cost estimate for relocating the facility, and in their response indicated that a location adjacent to the Existing LSU Red River Research Station was preferred (see Appendix F, pages F-117 and F-118).

DOTD investigated vacant land availability adjacent to the Red River Station and the possible cost to replace the Lucas Sludge Disposal Facility in the event that an alignment following the Preferred Corridor's southern route was ultimately selected.

A June 29, 2011 meeting to continue discussions on relocating the entire Station was scheduled with, but was unexpectedly cancelled by, LSU.

2.7 SELECTED ALIGNMENT IDENTIFIED IN THE FINAL EIS

In their September 6, 2011 letter, LSU informed DOTD that as a result of a continuing decline in state appropriations, LSU has decided to close the Station and withdrew their opposition to the Draft EIS Preferred Alignment (Line 6). No timeline for closing the facility was cited (see Appendix F, page F-121).

Line 6R and Line 6-2-6 were, therefore, eliminated from further consideration. The shift for Line 6R and the additional cost for providing a retaining wall to minimize Station impacts were no longer warranted. Line 6-2-6 would impact the Lucas Sludge Disposal facility, and increase regional transportation improvement costs to widen LA 1 and US 71 and extend the Inner Loop Extension. Line 6-2-6 is not the alignment preferred by the MPO and local officials.

Line 6 (Draft EIS Preferred Alignment) was the alignment preferred by Federal- and state-resource agencies, local officials, and the Northwest Louisiana Council of Governments (NLCOG), the designated Metropolitan Planning Organization (MPO) for transportation planning in the Shreveport-Bossier area.

After thorough consideration of the comments received on the Draft EIS; the additional environmental and engineering studies performed; and the comprehensive involvement by the public, local officials, federal and state resource agencies, and Native American tribes; sufficient information and public opinion exists to identify the Selected Alignment for the I-69 Project.

The Selected Alignment is identical to the Draft EIS Preferred Alignment (Line 6), except it includes the minor horizontal shift at US 71 to avoid the Elm Grove Baptist Church, a slight adjustment to the vertical profile to center the vertical curve over the Red River navigation span to reduce the bridge height, and the Red River bridge and the LA 1 and US 71 interchange bridges were lengthened to reduce the fill heights. The Selected Alignment also includes the Frontage Road between Stonewall Frierson Road in DeSoto Parish and Ellerbe Road in Caddo Parish (see Exhibit S-1).

AASHTO Interstate Design Standards (AASHTO 2005) and DOTD Engineering Directives (DOTD 2006) require a minimum interchange spacing of one mile in urban areas and three miles in rural areas. A Design Exception will be required for the Selected Alignment's interchange with I-49, which would be located in a rural area approximately 1.4 miles south of the existing I-49/LA 3276 interchange. An Interchange Justification Study (IJS) was prepared and the engineering and operational determination found

acceptable by FHWA on January 18, 2008 (see Appendix D, page D-140) at the proposed I-69/I-49 interchange at this spacing. A reassessment of the I-69/I-49 interchange for the revised traffic volumes (see Section 2.5.5) indicated that the location will operate at an acceptable level of service. The revised traffic analysis and results will be submitted to FHWA.

There were no significant changes in condition therefore final approval of the IJS may be given after issuance of the Record of Decision. Per DOTD requirements, the Design Exception for the I-49 interchange will be requested during final design.

Louisiana State legislation limits the amount of roadway that can be included in the State highway system. Therefore, after construction, the Frontage Road operational and maintenance responsibilities will be turned over to the local municipalities, most likely DeSoto and Caddo Parishes, so the amount of roadway included in the State highway system remains unchanged. Parish-City/State Agreements will be required to transfer maintenance responsibilities to the municipalities.

The Selected Alignment is presented on Exhibit 2-14 and is compared to the alignments presented in the Draft EIS on Exhibits S-1 and 4-1. The potential impacts and estimated construction costs for the Selected Alignment and the Draft EIS Preferred Alignment are presented in Table 2-14

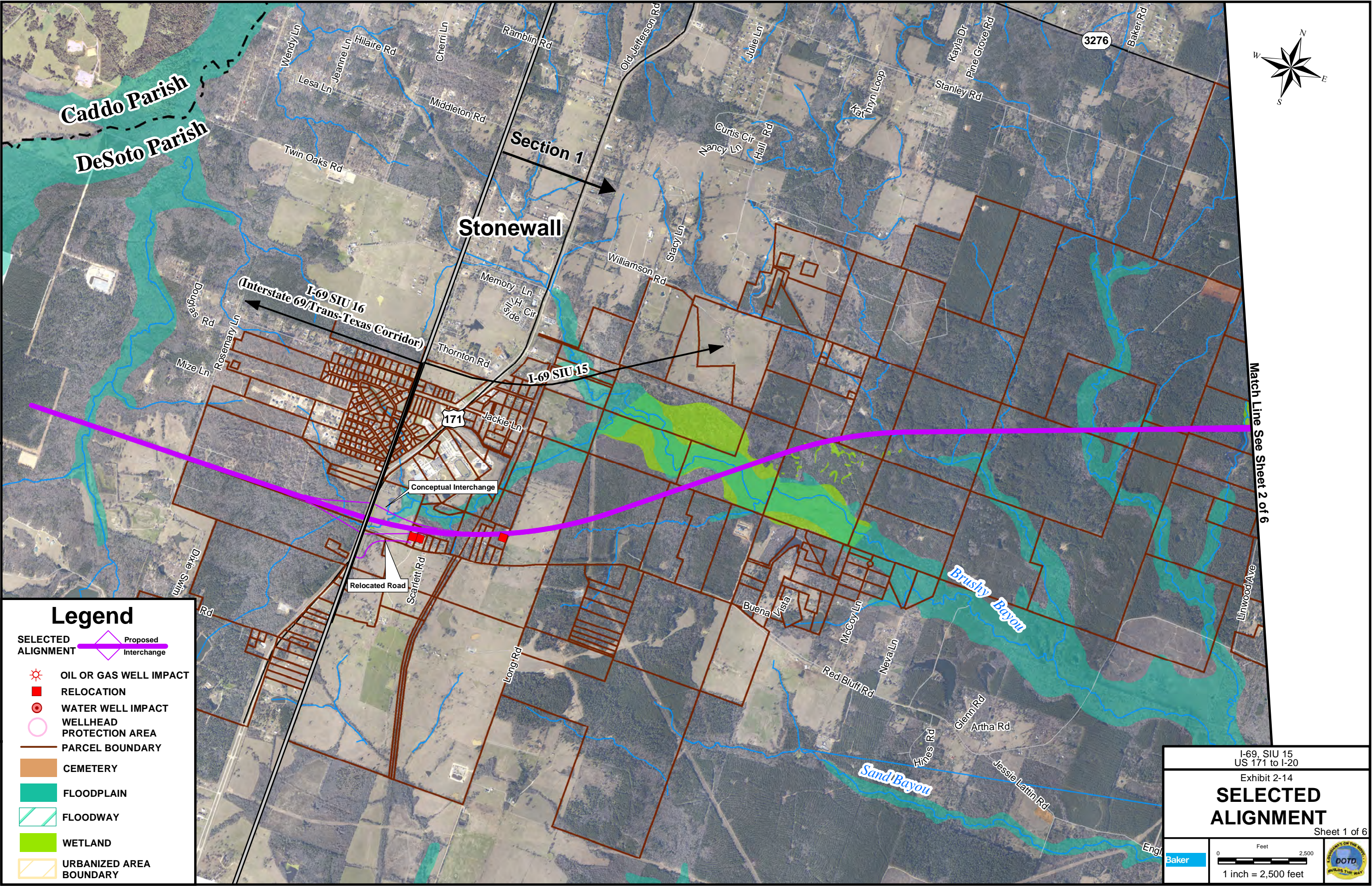
and are compared to the alignments presented in the Draft EIS in Table S-1. The Frontage Road potential impacts and estimated construction costs are presented separately so that the alignments developed can be more readily compared.

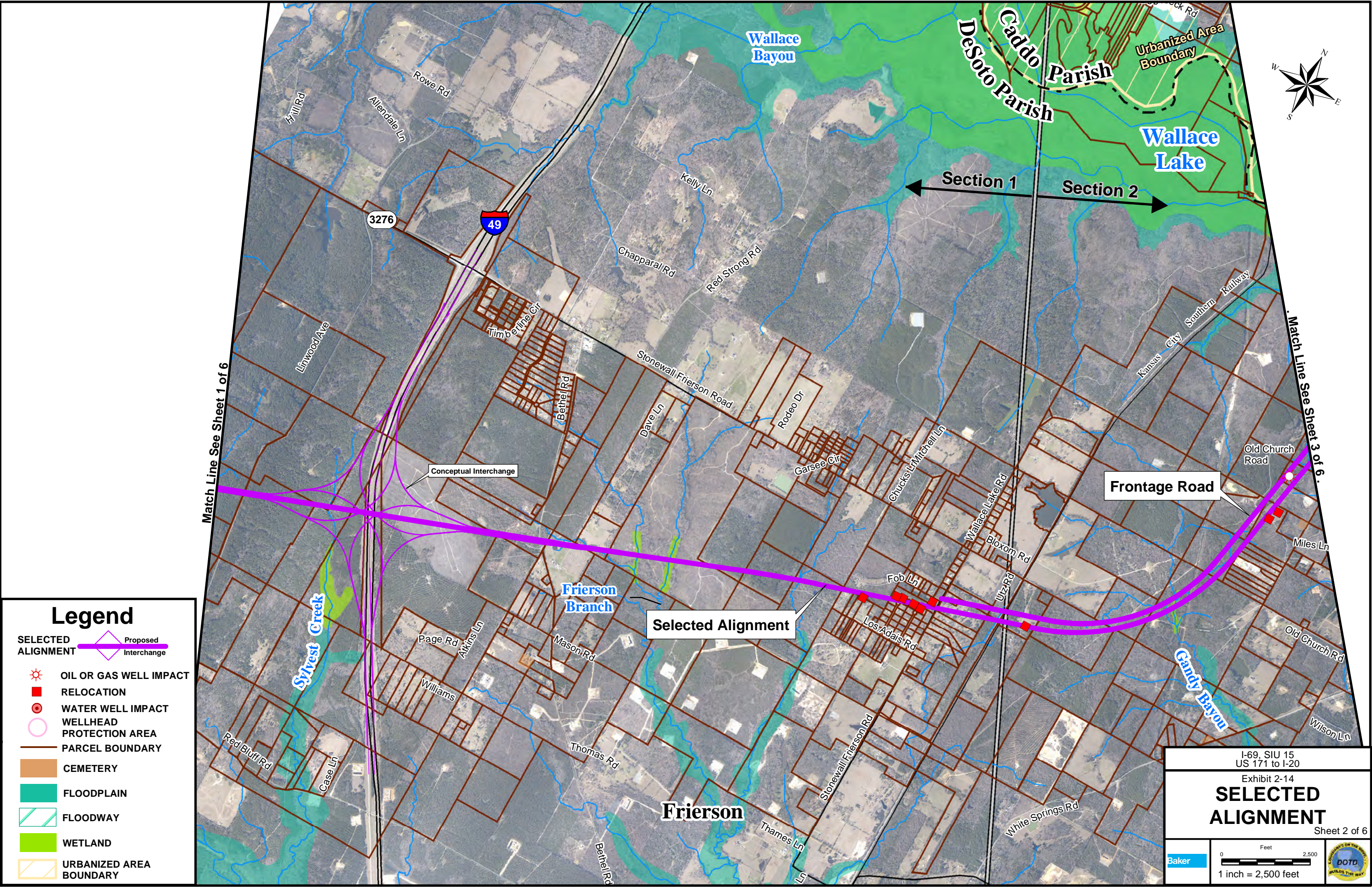
The Selected Alignment would bridge nearly all existing U.S. highways, state highways, parish and city roads and rail lines. In addition, bridges or culverts are proposed at the various surface water crossings depending on the roadway alignment and the upstream drainage area. Detailed bridge and hydraulic studies will be performed during final design. The Selected Alignment would have the least involvement with wetlands and best balances the expected project benefits with the overall impacts.

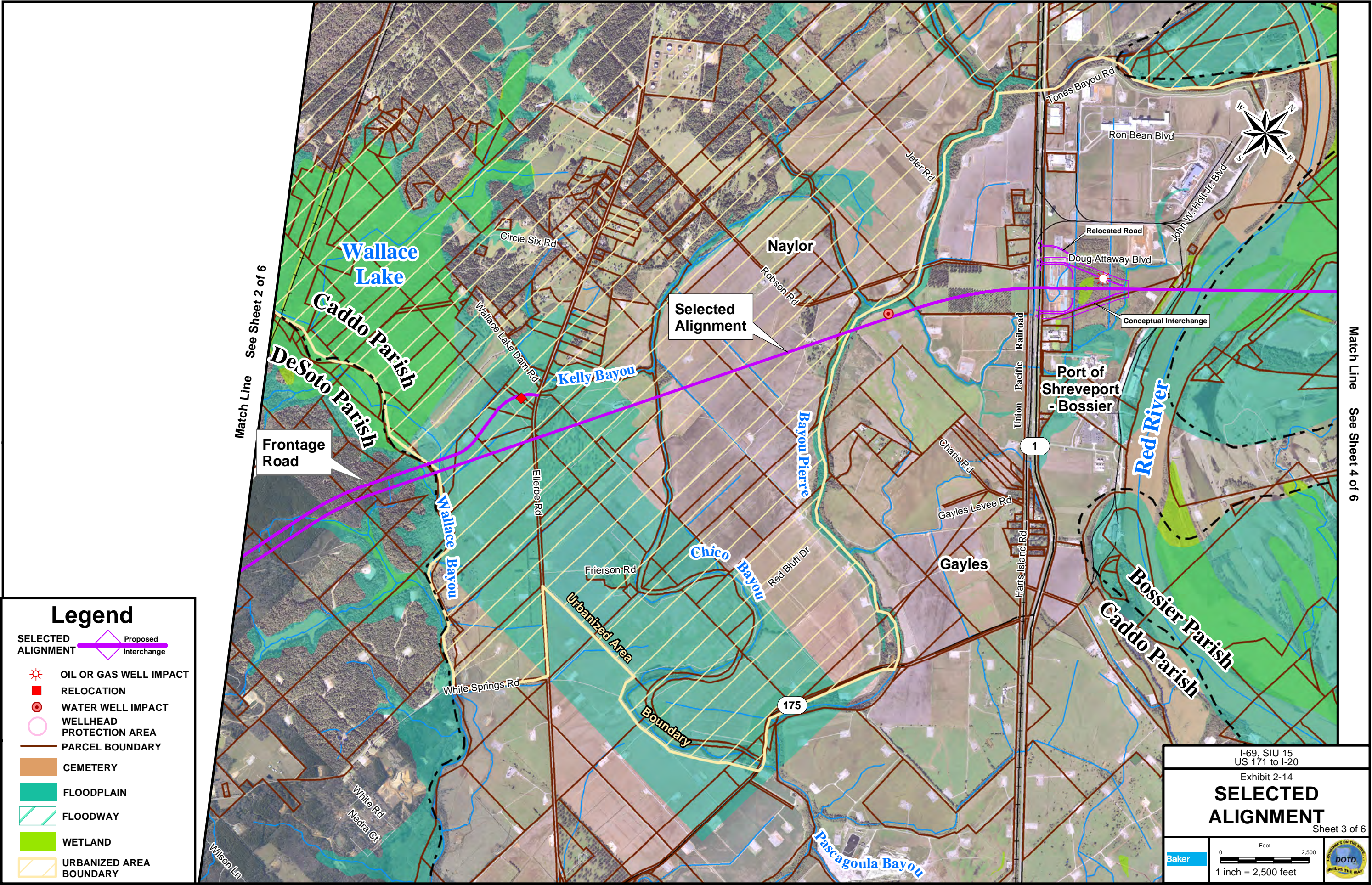
The Selected Alignment satisfies, to the fullest extent possible, the objectives of the merged NEPA/Section 404 process that has been adopted for this study. The project approach allowed a thorough consideration of all alternatives developed with respect to potential impacts to waters of the United States, including wetlands, and functioned as the Alternatives Analysis. Wetland impacts were minimized. The Selected Alignment would have the least amount of direct wetland impacts.

The Project is included in the Northwest Louisiana Long Range Transportation Plan (LRTP-2030) and was added to the 2010 Transportation Improvement Program (TIP) and Statewide

Transportation Improvement Program (STIP), for engineering/design in FY 2012 through MPO administrative amendment on February 27, 2012 (see Appendix F, page F-128). FHWA approved the STIP amendment on March 2, 2012 (see Appendix F, page F-130).







Legend

- SELECTED ALIGNMENT**
- Proposed Alignment
 - Interchange
- OIL OR GAS WELL IMPACT
 - RELOCATION
 - WATER WELL IMPACT
 - WELLHEAD PROTECTION AREA
 - PARCEL BOUNDARY
 - CEMETERY
 - FLOODPLAIN
 - FLOODWAY
 - WETLAND
 - URBANIZED AREA BOUNDARY

I-69, SIU 15
US 171 to I-20

Exhibit 2-14

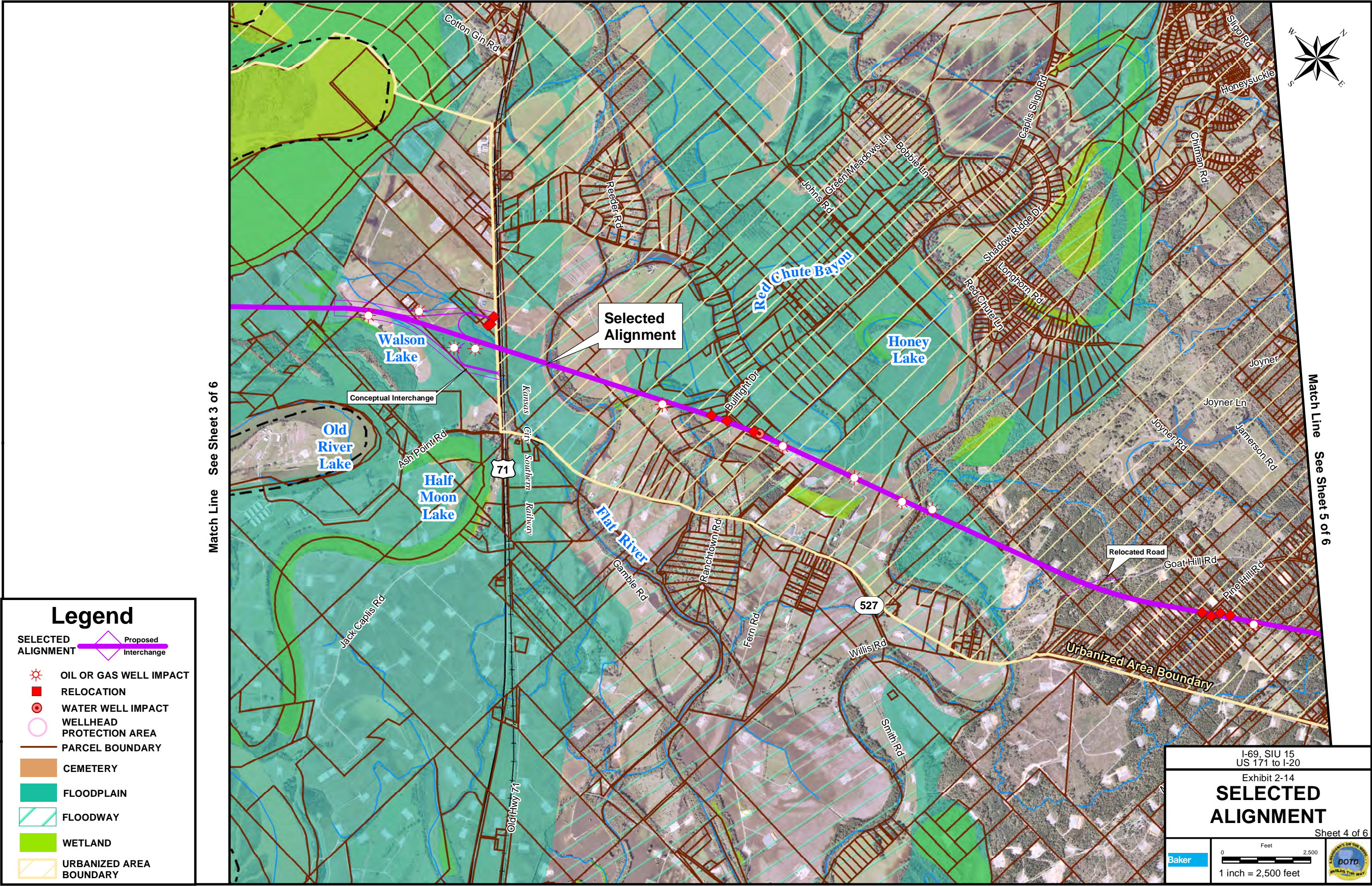
SELECTED ALIGNMENT

Sheet 3 of 6

Baker

0 2,500
1 inch = 2,500 feet

DOTD
BUILDING THE WAY



Legend

SELECTED ALIGNMENT

- Proposed Interchange
- OIL OR GAS WELL IMPACT
- RELOCATION
- WATER WELL IMPACT
- WELLHEAD PROTECTION AREA
- PARCEL BOUNDARY
- CEMETERY
- FLOODPLAIN
- FLOODWAY
- WETLAND
- URBANIZED AREA BOUNDARY

I-69, SIU 15
US 171 to I-20

Exhibit 2-14

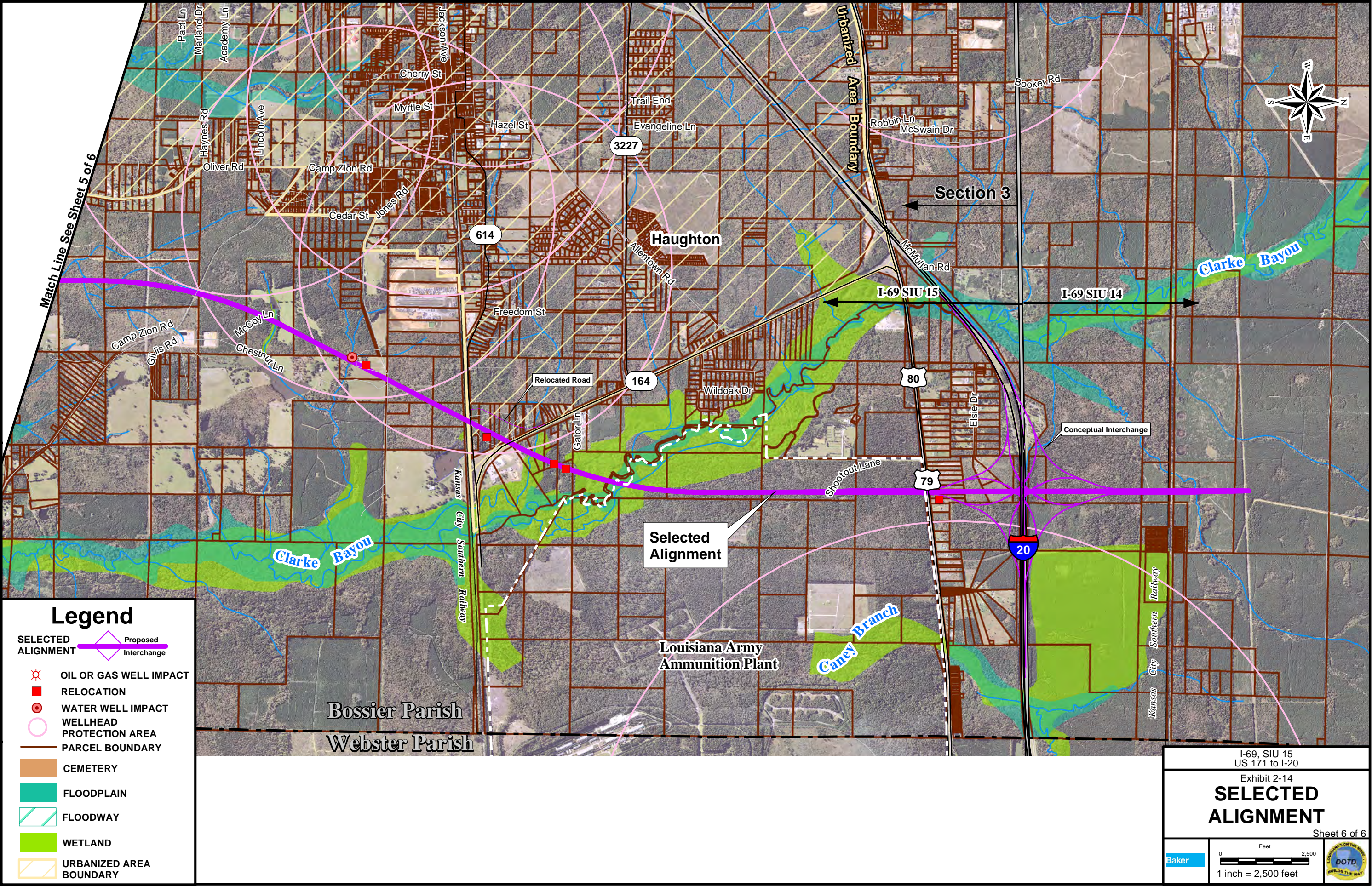
SELECTED ALIGNMENT

Sheet 4 of 6

Baker

0 2,500
1 inch = 2,500 feet

TEXAS
DOTD
BUILDING THE WAY



I-69, SIU 15
US 171 to I-20

Exhibit 2-14
**SELECTED
ALIGNMENT**

Sheet 6 of 6

Baker

0 2,500
1 inch = 2,500 feet




Table 2-14 DEIS PREFERRED AND SELECTED ALIGNMENT IMPACT SUMMARY																													
Section	Alignment	Length (miles)	Construction Costs ¹ 2011 Base Year (in 000s)	ROW & Utility Costs ¹ 2011 Base Year (in 000s)	Structures ²						Cemeteries	Natural Resources					Cultural Resources			Prehistoric Archaeology Probability Areas			Wellhead Protection Areas	Known Haz Mat Sites	Water Wells ²	Producing Oil and Gas Wells ²			
					Houses	Mobile Homes	Apartment Buildings	Businesses	Churches	Public Facilities		Wetlands		Known T&E Species Locations	100-Year Floodplains ²	Floodways ²	NRHP Listed Sites	Recorded Potentially Eligible Sites	Recorded Ineligible Sites	High Medium Low									
																				ac	ac	ac							
																											#	#	#
												#	ac	#	ac	ac	Caddoan	Caddoan	Caddoan	Upland	Upland	Upland				Oil			
Gas																													
1	Line 6 (DEIS Preferred)	9.1	\$235,961	\$12,426	4	5	-	-	-	-	-	11	10.5	-	15.2	-	-	-	-	-	-	-	-	-	-	-			
	Selected Alignment ³	9.1	\$235,961	\$12,426	4	5	-	-	-	-	-	11	10.5	-	15.2	-	-	-	-	-	-	-	-	-	-	-			
2	Line 6 (DEIS Preferred)	15.9	\$361,786	\$19,057	3	12	-	-	1	-	-	11	11.0	-	123.4	44.6	-	-	-	25.3	231.5	122	-	-	3	-			
	Selected Alignment ³	15.9	\$411,111	\$19,242	2	11	-	-	-	-	-	16	10.2	-	150.2	49.8	-	-	-	25.8	225.1	122	-	-	2	-			
3	Line 6 (DEIS Preferred)	10.6	\$204,734	\$11,384	1	5	-	-	-	-	-	4	22.3	-	11.3	-	-	1	-	-	-	-	4	-	1	-			
	Selected Alignment ³	10.6	\$204,734	\$11,384	1	5	-	-	-	-	-	4	22.3	-	11.3	-	-	1	-	-	-	-	4	-	1	-			
TOTALS	No-Action	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Line 6 (DEIS Preferred)	35.6	\$802,481	\$42,867	8	22	-	-	1	-	-	26	43.8	-	149.9	44.6	-	1	-	25.3	231.5	122.0	4	-	4	-			
	Selected Alignment ³	35.6	\$851,806	\$43,052	7	21	-	-	-	-	-	31	43.0	-	176.7	49.8	-	1	-	25.8	225.1	122.0	4	-	3	-			
	Frontage Road	4.2	\$17,729	\$1,885	2	-	-	-	-	-	-	5	0.7	-	16.2	-	-	-	-	1.9	-	13.8	-	-	-	-			

Source: Michael Baker Jr., Inc.
¹ Updated 2012, construction costs include design engineering, mitigation and construction engineering/inspection
² Updated 2010
³ Selected Alignment is Line 6 (DEIS Preferred) with minor modifications

- Selected Alignment
RRAV - Red River Alluvial Valley
Upland - Upland Areas
Caddoan - Sites with Caddoan Components

2.8 IMPLEMENTATION PLAN

2.8.1 Project Implementation Phasing

A project implementation plan developed for the Selected Alignment consists of five implementation segments that can be constructed independently and provide a reasonable schedule and funding level for planning purposes. The five implementation segments for the Selected Alignment are separated by the six project interchanges at US 171, I-49, LA 1, US 71, LA 157 and I-20 with five sections of highway connecting those interchanges (see Exhibit S-2). The Northwest Louisiana Council of Governments Shreveport-Bossier City area Metropolitan Planning

Organization (MPO) established the implementation phase priority that would best meet the future travel demands of the Region. On November 7, 2011, the MPO Transportation Policy Committee agreed with the Technical Advisory Committee's (TAC) recommendation that the Red River bridge be constructed first, followed by the segment between I-49 and LA 1, then US 71 to LA 157, LA 157 to I-20, and finally US 171 to I-49. The limits, lengths and priority of the five implementation segments are shown in Table 2-15.

**Table 2-15
IMPLEMENTATION PRIORITIZATION**

Implementation Priority	Segment ID	FEIS Section	Parish	Limits	Approx. Length (miles)
1	3	2	Caddo / Bossier	LA 1 to US 71 Red River Crossing	3.1
2	2	1, 2	DeSoto / Caddo	I-49 to LA 1	10.1
	Frontage Road	2	DeSoto / Caddo	Bloxom Road to Ellerbe Road	4.2
3	4	2	Bossier	US 71 to LA 157	6.2
4	5	3	Bossier	LA 157 to I-20	10.6
5	1	1	DeSoto	US 171 to I-49	5.6

Source: Michael Baker Jr., Inc. 2011

2.8.2 Cost Estimates by Phase

Preliminary cost estimates for each implementation segment of the Selected Alignment were developed by phase including engineering, mitigation, right-of-way (ROW) acquisition and utility relocation costs, and construction. (see Table 2-16). Construction costs include earthwork, grading, drainage, base and pavement, bridges, and a 15% engineering design, construction inspection and administrative expense. ROW costs include land acquisition, relocation expenses for residences, producing oil and gas well acquisition, utility relocations, and

a 40% ROW and utility administrative expense. The cost estimates were developed in year 2011 value of the U.S. dollar.

2.8.3 Implementation Schedule & Year-of-Expenditure Costs

For planning purposes, an implementation schedule was developed by implementation segment and phase. The project is anticipated to take 12 years to design and construct, starting in 2014 and extending through 2026 (see Table S-2).

Table 2-16
COST ESTIMATE BY IMPLEMENTATION SEGMENT
(IN YEAR 2011 \$)

Segment ID	Engineering and CE&I	ROW	Construction	TOTAL
3	\$28,468,999	\$5,877,830	\$240,732,651	\$275,079,480
2	\$16,845,090	\$10,717,445	\$148,766,167	\$176,328,702
Frontage Road	\$1,709,160	\$1,884,400	\$16,019,903	\$19,613,462
4	\$8,137,660	\$7,695,590	\$73,391,360	\$89,224,609
5	\$20,728,690	\$11,384,100	\$184,005,234	\$216,118,024
1	\$13,630,292	\$7,377,135	\$117,100,287	\$138,107,714
TOTALS	\$89,519,889	\$44,936,500	\$780,015,602	\$914,471,991

Source: Michael Baker Jr., Inc. 2011

The Year 2011 preliminary cost estimates were converted to year of expenditure (YOE) costs through applying a forecasted four-percent annual inflation rate to account for the time period that a particular segment and phase is being implemented. The implementation schedule

includes the total estimated cost in YOE dollars per construction year (see Table S-2).

2.9 CORRIDOR PRESERVATION

At this time, the DOTD has no plans to develop a management approach and prepare a formal corridor preservation plan for the Project. A joint cooperative endeavor agreement will be entered

into between DOTD, FHWA, NLCOG and/or other municipalities should future preparation of a corridor preservation plan be warranted.

2.10 FINAL DECISION ON THE SELECTED ALIGNMENT

The Selected Alignment will be subject to public, local official, federal and state resource agency,

and Native American tribal review during the comment period for the Final EIS. A final decision on the highway alignment ultimately selected for the I-69 project will not be made until all comments received on the Final EIS are fully evaluated. The alignment decision will be documented in the project's Record of Decision.